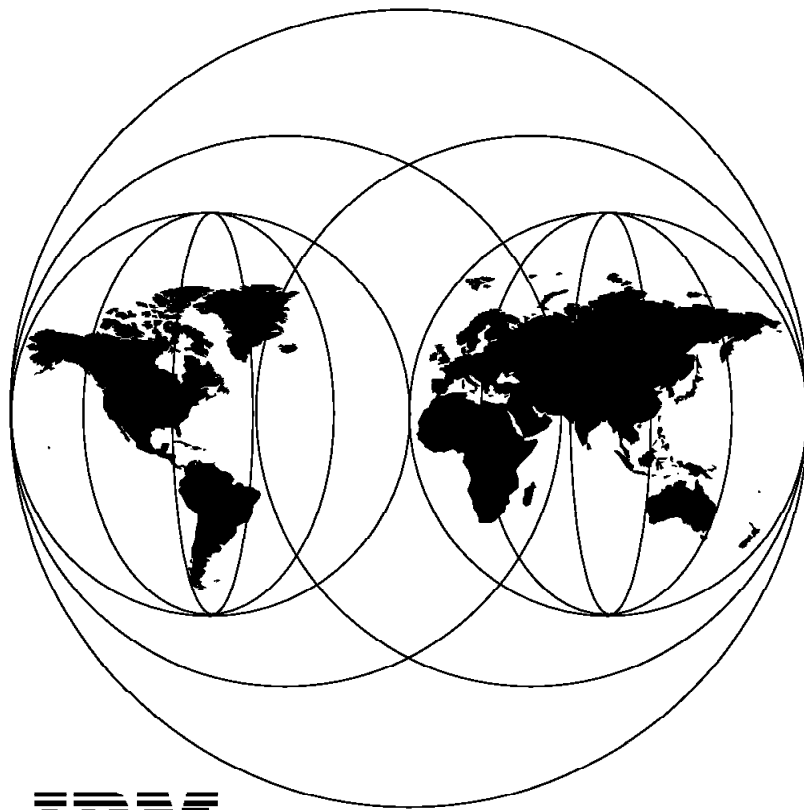


International Technical Support Organization

SG24-4171-01

3174 APPN Implementation Guide Update

October 1995



IBM

**International Technical Support Organization
Raleigh Center**



International Technical Support Organization

SG24-4171-01

3174 APPN Implementation Guide Update

October 1995

Note!

Before using this information and the product it supports, be sure to read the general information under "Special Notices" on page xxvii.

Second Edition (October 1995)

This edition applies to the 3174 Establishment Controller Configuration Support-C 3, 4, 5 and 6 Licensed Internal Code (LIC) Advanced Peer-to-Peer Networking and Peer Communications functions.

Order publications through your IBM representative or the IBM branch office serving your locality. Publications are not stocked at the address given below.

An ITSO Technical Bulletin Evaluation Form for reader's feedback appears facing Chapter 1. If the form has been removed, comments may be addressed to:

IBM Corporation, International Technical Support Organization
Dept. HZ8, Building 678
P.O. Box 12195
Research Triangle Park, NC 27709-2195

When you send information to IBM, you grant IBM a non-exclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

© **Copyright International Business Machines Corporation 1995. All rights reserved.**

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Abstract

This document describes the enhancements to 3174 Configuration Support-C Advanced Peer-to-Peer Networking (APPN) feature since Release 2. The focus is implementing the 3174 Establishment Controller Configuration Support-C Release 3,4,5 and 6 Licensed Internal Code (LIC) in APPN network scenarios involving APPN VTAM, Communications Manager/2, AIX SNA Services Version 2.1, AS/400 and PC Support/400. Scenarios are used to emphasize the 3174 APPN support over, LAN (token-ring and Ethernet), SDLC, channel, Peer Communications (LAN over coax), X.25, Frame Relay and ESCON.

This document is intended for IBM and customer system engineers, system planners, system programmers and network administrators who need to know how to customize the 3174 for APPN and Peer Communication functions and relate the customization responses to the various IBM APPN and APPC products. A working knowledge of SNA VTAM communications and APPN is assumed.

(502 pages)

Contents

Abstract	iii
Special Notices	xxvii
Preface	xxix
How This Document is Organized	xxix
Related Publications	xxxii
International Technical Support Organization Publications	xxxii
ITSO Redbooks on the World Wide Web (WWW)	xxxiii
Acknowledgments	xxxiv
Chapter 1. 3174 APPN Implementation	1
1.1 Functions and Levels of Support	6
1.2 3174 APPN LIC Feature Connectivity	8
1.2.1 Supported Links	8
1.2.2 Unsupported Links	9
1.2.3 3174 APPN Connectivity Summary	10
1.3 3174 APPN Network Node Feature	11
1.3.1 Control Point	11
1.3.2 Intermediate Session Routing	13
1.3.3 LU 6.2 Services	13
1.4 3174 Network Node Services	14
1.4.1 Link Activation	14
1.4.2 Network Node Server	15
1.4.3 LEN/Subarea Routing	17
1.4.4 Multiple Link Support (Multitail)	27
1.4.5 Surrogate Resource Support	29
1.5 Link Types	30
1.5.1 Explicit Links	32
1.5.2 Dynamic Homogenous T2.1 Links	33
1.5.3 Dynamic Shared Link	33
1.5.4 Shared Link Customization Considerations	35
1.5.5 Mismatched Link Types	36
1.5.6 Shared Link Customization Example	37
1.6 3174 and VTAM SSCP Takeover	38
1.6.1 SSCP Takeover Before Link Establishment	39
1.7 Transmission Groups (TGs)	40
1.7.1 Parallel Transmission Groups	40
1.7.2 Multiple Transmission Groups (TGs)	41
1.8 Border Node Support	42
1.9 Dependent LU Requester	43
1.9.1 Implementation Considerations	45
1.9.2 Operational Changes	46
1.10 Central Directory Client	46
1.11 Network Management	46
1.11.1 Summary of Enhancements	47
1.12 Connection Networks	48
1.12.1 Connection Network Definitions	49
1.13 Online Tests (RAS)	50
1.13.1 Test 3, 3270 Device Status	50
1.13.2 Test 15 - 3270 Host Status Summary	51

1.13.3 Test 17, APPN Tests	52
Chapter 2. 3174 Peer Communication with APPN	57
2.1 Peer Workstation Requirements	57
2.2 DOS Support	58
2.2.1 Configuring NDIS for DOS	58
2.2.2 Packaging	60
2.2.3 Memory Considerations	60
2.2.4 Compatibility with Novell NetWare	60
2.3 OS/2 Support	60
2.3.1 Configuring NDIS for OS/2	60
2.3.2 Packaging	62
2.3.3 Compatibility with Novell NetWare	62
2.4 Prerequisites	62
2.5 Physical Configuration	63
2.6 Logical Configuration	63
2.7 LAN Addressing	64
2.8 Bridge Function	65
2.9 LAN Manager Support	65
2.10 3174 APPN and Peer Communication Combined	66
Chapter 3. 3174 APPN and Peer Communication Customization	67
3.1 Master Menu	69
3.2 Customize Control Disk Menu	69
3.3 Model/Attach	70
3.3.1 Question 100: 3174 Model Designation	71
3.3.2 Question 101: Host Attachment	71
3.3.3 Question 102: LAN Adapter Type	71
3.3.4 Question 103: Non-Standard Operation Selection	71
3.4 Local (SNA)	72
3.4.1 Question 242: Link Type	72
3.5 SDLC	73
3.6 X.25	74
3.7 Frame Relay	74
3.8 Common SNA	75
3.8.1 Question 501: Network ID(NETID)	76
3.8.2 Question 510: APPN Network Controller	76
3.8.3 Question 511: APPN Control Point Name (CPNAME)	76
3.8.4 Question 512: APPN Virtual Node Name (VNODE)	77
3.9 APPN Node Definition	78
3.9.1 Question 610: APPN Sessions	79
3.9.2 Question 611: APPN Nodes/Links	79
3.9.3 Question 612: APPN Wildcard Option	80
3.9.4 Question 613: APPN Wildcard Host Link	80
3.9.5 Question 614: Alert Focal Point	81
3.9.6 Question 615: Alert Focal Point Network ID	81
3.9.7 Question 616: Alert Focal Point (Host Links)	81
3.9.8 Question 620: Dependent LU Server (DLUS) Primary Host Name	81
3.9.9 Question 621: Dependent LU Server (DLUS) Primary Host Network ID	81
3.9.10 Question 622: Dependent LU Server (DLUS) Backup Host Name	81
3.9.11 Question 623: Dependent LU Server (DLUS) Backup Host Network ID	81
3.10 Network Resources Definition	82
3.10.1 Network Resources Qualifier	84
3.10.2 Associated LUs	84

3.10.3	X.25 APPN Nodes	85
3.11	COS Definition	86
3.11.1	IBM-Supplied COS Tables	86
3.11.2	COS Table Manipulation	87
3.11.3	Mode/COS Correlation	89
3.12	3174-Peer Definition	90
3.12.1	Question 650: 3174-Peer Support	91
3.12.2	Question 651: Bridge Support	92
3.12.3	Question 652: LAN Manager Support	92
3.12.4	Question 653: 3174-Peer Online Test Updates	93
3.12.5	Question 660: 3174-Peer Port Address Range	93
3.12.6	Question 661: Percentage of Discard Threshold	94
3.13	3174-Peer Bridge Profile	95
3.13.1	Question 670: Bridge Number	95
3.13.2	Question 671: Token-Ring Segment Number	96
3.13.3	Question 672: 3174-Peer Segment Number	96
3.13.4	Question 673: Token-Ring Hop Count	96
3.13.5	Question 674: Frame Forwarding Active	96
3.13.6	Question 675: Bridge Performance Threshold	97
3.13.7	Question 676: Logging Interval	97
3.13.8	Question 677: Alert Threshold	97
3.13.9	3174-Peer Bridge Profile Online Test Update	98
3.13.10	LAN Manager Profile	98
3.14	WAN Profiles	99
3.14.1	Question 401: Circuit Type	100
3.14.2	Question 420: Incoming Call Options	100
3.14.3	Question 421: Outgoing Call Options	100
3.14.4	Question 430: Negotiated Packet (NPKT) or PVC Packet Size	100
3.14.5	Question 432: Negotiated Window Size (NWND) or PVC Window Size	100
3.14.6	Question 440: Throughput Class Negotiation (TCLS)	100
3.14.7	Question 441: Closed User Group (CUG)	100
3.14.8	Question 442: Recognized Private Operating Agency (RPOA)	100
Chapter 4.	Hardware and Software Requirements	101
4.1	Hardware	101
4.1.1	3174 Control Storage	101
4.1.2	APPN Storage Requirements	101
4.1.3	Peer Communication Storage Requirements	102
4.1.4	Total Storage Requirements	103
4.1.5	Deconfigure	103
4.1.6	3174 Other Hardware	103
4.1.7	Software	104
4.1.8	APPN and Peer Communication LIC Feature Numbers	105
Chapter 5.	APPN VTAM Considerations	107
5.1	VTAM Start List	109
5.2	Link Type Definition	109
5.2.1	T2.1 Links	109
5.2.2	Shared T2.0/2.1 Link Support	110
5.3	Mode Name and COS	111
5.4	SSCP Takeover	112
5.5	Multiple Link Support (Multitail)	112
5.6	Prerequisites	112

Chapter 6. AS/400 Considerations	115
6.1 AS/400 Border Node Support	115
6.2 Terminology	115
6.3 Prerequisites	116
Chapter 7. Personal Systems/2 Considerations	117
7.1 Communications Manager/2 Considerations	117
7.2 NetView DM/2	117
7.3 Distributed Console Access Facility	118
7.4 Personal Communications	118
Chapter 8. 3174 NN with VTAM APPN Nodes (Token-Ring)	119
8.1 Configuration	119
8.2 Definition Overview	120
8.3 VTAM and NCP Definitions	120
8.3.1 3174 Switched Major Node	120
8.3.2 RAB's Network Node Server	121
8.3.3 Host Applications	121
8.3.4 VTAM Start Options	122
8.4 3174-11L Definitions	123
8.4.1 Enabling 3174 APPN	123
8.4.2 Defining 3174 APPN Resources	123
8.5 Activation and Verification of the Configuration	125
8.5.1 The Dependent LU and Independent LU Sessions	127
8.5.2 Verification Using 3174 Online Test 17, 2	128
Chapter 9. 3174 via Shared SDLC Link to an AS/400	129
9.1 Configuration	129
9.2 Definition Overview	130
9.3 VTAM and NCP Definitions	131
9.4 AS/400 Definitions	132
9.4.1 Network Attributes for RALYAS4A	132
9.4.2 Line Description to the 3174	133
9.4.3 Controller Description for CP3174	134
9.4.4 Device Description for CP3174 Dependent LUs	135
9.4.5 Device Descriptions 5250 ILUs	136
9.4.6 Descriptions for 3174 Gateway DSPUs	137
9.4.7 Descriptions for Host Connection	139
9.4.8 Device Description for Host Dependent LUs	140
9.5 3174-11R Customization	141
9.5.1 Defining the 3174 Attachments	141
9.5.2 Enabling the 3174 APPN	142
9.5.3 Assigning the LAN Address	143
9.5.4 Defining the DSPU Served by the Gateway	143
9.5.5 Defining the 3174 APPN Resources	144
9.5.6 Mode/COS Correlation	145
9.6 LAN Adapter and Protocol Support Configuration	146
9.6.1 LAN Adapter and Protocol Support (CONFIG.SYS)	147
9.7 Communications Manager/2 Definition	148
9.7.1 Communications Manager/2 Installation and Setup Version 1.0	148
9.7.2 Configuring 3270 Emulation	149
9.7.3 Configuring the Data Link Control	150
9.7.4 Configuring the Local Node Characteristics	151
9.7.5 Configuring the SNA Connections	152
9.7.6 Configuring 3270 Emulation Sessions	154

9.7.7	Configuring 5250 Emulation	156
9.7.8	Configuring the SNA Connection	157
9.7.9	Communication Manager/2 (PSEN3174.NDF)	159
9.8	Configuring the DOS Workstation	161
9.8.1	Configuring 3270 Emulation	161
9.8.2	Configuring Connection to AS/400	163
9.8.3	PC Support RUMBA/400 for 5250 Emulation (T2.1)	164
9.8.4	DOS CONFIG.SYS	165
9.9	Verification at the 3174	165
9.10	Verification and Activation from the AS/400	165
Chapter 10.	SNA Primary LU2 Support (SPLS) via a 3174 GW	167
10.1	Configuration	167
10.2	Definition Overview	168
10.3	VTAM Definitions	169
10.4	3174 Definitions	170
10.4.1	Defining 3174 Attachments	171
10.4.2	Enabling 3174 APPN	172
10.4.3	Defining the LAN Address and DSPUs	172
10.4.4	Defining 3174 APPN Resources	173
10.4.5	Adding and Correlating Modes to COS	174
10.5	AS/400 Definitions	175
10.5.1	AS/400 System A Definitions	175
10.5.2	AS/400 System B Definitions	176
10.6	Verification from the Host Perspective	177
10.7	Verification from the 3174 Perspective	179
10.8	Verification for the AS/400 Perspective	179
10.9	Prerequisites	180
Chapter 11.	RS/6000 NN via 3174-11L to RS/6000 NN	181
11.1	Configuration	181
11.2	Definition Overview	182
11.3	3174-11L Customization	182
11.3.1	Configuring the 3174 Host Attachment	183
11.3.2	Common SNA	184
11.3.3	Common Network	184
11.3.4	Configuring the LAN Attachments	185
11.3.5	Defining the Adjacent Resources	185
11.4	AIX SNA Services Configuration	186
11.4.1	SNA Global Information	186
11.4.2	Active Links Information	187
11.4.3	Display LU 6.2 Session Information	187
11.4.4	LU 6.2 Session Information	188
11.4.5	Directory Information	190
Chapter 12.	Using DLUR with DDDL	191
12.1	Configuration	191
12.2	Definition Overview	192
12.3	VTAM Customization	193
12.4	3174 Customization	194
12.4.1	Defining the 3174 Attachments	194
12.4.2	Enabling APPN	195
12.4.3	Defining the 3174 APPN Resources	195
12.5	Verification at the 3174	196
12.6	Verification at the Host	199

Chapter 13. DLUR-DLUS and PLU on the Same Host	201
13.1 Configuration	201
13.2 Definition Overview	202
13.3 3174-11R Customization	202
13.3.1 Defining the 3174 Attachments	203
13.3.2 Enabling 3174 APPN	205
13.3.3 Defining the LAN Network Common Parameters	205
13.3.4 Defining the 3174 APPN Resources	206
13.4 3174-13R Customization	207
13.4.1 Defining 3174 Attachment	207
13.4.2 Enabling APPN	208
13.4.3 Defining the 3174 APPN Resources	209
13.5 NCP Definition for the SDLC Attached AS/400	210
13.6 VTAM Definitions	210
13.7 AS/400 Definitions	211
13.8 Activation	212
13.9 Verification from a 3174 Perspective	214
13.10 Verification from a Host Perspective	218
 Chapter 14. DLUR with DLUS and PLU on Different Hosts	 221
14.1 Configuration	221
14.2 Definition Overview	222
14.3 VTAM Definitions	222
14.4 Verification Using 3174 Online Tests	222
 Chapter 15. Border Node Support via the AS/400	 227
15.1 Configuration	227
15.2 Definition Overview	228
15.3 3174 Customization	229
15.3.1 Enabling 3174 APPN	229
15.3.2 Defining the 3174 Adjacent Nodes	229
15.4 AS/400 Definitions	230
15.5 PS/2 Customization	232
15.5.1 CM/2 Configuration	232
15.5.2 DCAF Setup	235
15.6 Verification at the 3174s	237
15.6.1 Verification from the 3174-11R Perspective	237
15.6.2 Verification from the 3174-13R Perspective	239
 Chapter 16. APPN over Frame Relay	 241
16.1 Configuration	241
16.2 Definition Overview	242
16.3 3174 Customization	242
16.3.1 Defining 3174 Attachments	242
16.3.2 Enabling 3174 APPN	244
16.3.3 Defining the Gateway Links	244
16.3.4 Frame Relay Index Assignment	245
16.3.5 Defining the Gateway LAN Attachment	246
16.3.6 Defining the Frame Relay Circuit	247
16.3.7 Defining the 3174 APPN Resources	248
16.4 NCP Definitions	250
16.5 VTAM Definitions	252
16.6 AS/400 Definitions	254
16.7 PS/2 Customization	255
16.7.1 Communications Manager/2 Workstation	255

16.7.2 DOS PS/2 Customization	257
16.8 Verification from the 3174 Perspective	260
16.9 Verification from the Host Perspective	267
16.10 Verification from the AS/400 Perspective	268
Chapter 17. APPN over X.25	269
17.1 Configuration	269
17.2 Definition Overview	270
17.3 3174-11R Customization	270
17.3.1 Defining the 3174-11R Attachments	270
17.3.2 Enabling 3174 APPN	272
17.3.3 X.25 Circuit Definitions	272
17.3.4 WAN Profiles	273
17.3.5 APPN Network Definition	274
17.4 3174-14R Customization	276
17.4.1 Defining the 3174-14R Attachment	276
17.4.2 Enabling 3174 APPN	277
17.4.3 Defining the 3174 APPN Resources	278
17.5 NCP and NPSI Definitions	279
17.6 VTAM Definitions for CP31747 and CP31741	279
17.7 AS/400 Definitions for RALYAS4B	282
17.8 PS/2 Customization	284
17.9 Verification for the 3174	284
17.10 APPN over X.25 PVC and SVC Concurrently	289
17.10.1 X.25 Circuit Definitions	289
17.10.2 WAN Profiles	290
17.10.3 Defining 3174 APPN Resources	291
17.11 NCP Definition for PVC Connection	292
17.12 VTAM Definition for PVC Connection	292
17.13 Verification from the 3174 Perspective	293
17.14 Verification from a Host Perspective	295
Chapter 18. APPN over 3174 ESCON Channel Connection	297
18.1 Configuration	297
18.2 Definition Overview	298
18.3 3174-12L Customization	299
18.3.1 Configuring the 3174 Host Attachment for host 1A	300
18.3.2 Configuring the 3174 Host Attachment for host 1B	303
18.3.3 Common 3174 Customization	305
18.3.4 3174 Online Test Panels after IML	307
18.3.5 VTAM Definitions	311
18.3.6 VTAM Displays	313
18.3.7 PS/2 Configuration	314
18.3.8 PS/2 VERIFICATION	315
Chapter 19. APPN Management Services Support and Scenarios	317
19.1 APPN MS Functions in Configuration Support-C Release 5 and Later	319
19.1.1 EP_ALERT Function	319
19.1.2 MS_CAPS	320
19.2 Environment	321
19.3 APPN Focal Point Management Services to NetView LU	323
19.4 Configuration	323
19.5 Definition Overview	324
19.5.1 3174-12L Customization	325
19.5.2 Online Tests	326

19.5.3	NetView System Displays	326
19.5.4	3174 Status Log	330
19.5.5	VTAM Display	330
19.6	APPN Focal Point Management Services to VTAM CPNAME	331
19.7	Configuration	331
19.8	Definition Overview	332
19.8.1	3174-12L Customization	332
19.8.2	Online Tests	333
19.8.3	NetView System Displays	334
19.8.4	3174 Status Log	338
19.8.5	VTAM Displays	338
19.9	APPN Focal Point Management Services to AS/400	340
19.10	Configuration	340
19.11	Definition Overview	341
19.11.1	3174-12L Customization	341
19.11.2	Online Tests	342
19.11.3	AS/400 System Displays	342
19.11.4	3174 Status Log	345
Chapter 20.	3174 APPN with Peer Communications and Bridging	347
20.1	Scenario: Bridging between Two 3174s	347
20.1.1	Configuration Diagram for Routed Network	348
20.1.2	3174 Customization	350
20.1.3	Peer Communication Definition for OS/2 (WS-D)	353
20.1.4	Network Definition File (NDF) for Workstations A, C, and D	354
20.1.5	VTAM and NCP Definitions	355
20.1.6	Configuration Diagram for the Bridged Network	356
20.1.7	Logical View of Bridged Network	357
20.1.8	Changes to the 3174-11R Configuration	358
20.1.9	Changes to the APPN Configuration	360
20.1.10	New: 3174-13R Peer and Bridges Configuration	361
20.1.11	Changes to the 3174-43R Configuration	364
20.1.12	Changes to the APPN Configuration	365
20.1.13	New: 3174-43R Peer and Bridges Configuration	365
20.1.14	Changes to Workstation Definitions	367
20.1.15	Changes to VTAM/NCP Definitions	368
20.1.16	Verifying the Bridge Operation	371
Chapter 21.	3174 CSCM Using NetView Distribution Manager/2	389
21.1	Configuration	389
21.2	Definition Overview	390
21.3	NetView DM/2 Definitions	390
21.3.1	User Profile Management Considerations	390
21.3.2	LAPS NetBIOS Support	390
21.3.3	Prepare NetView DM/2 Workstations	394
21.3.4	Definition of Remote Destinations	409
21.4	3174 Definitions	412
21.4.1	Prepare 3174 Establishment Network Controller	412
21.5	Activation and Verification	415
21.5.1	Using 3174 CSCM	416
21.6	Prerequisites	421
Appendix A.	3174 APPN Newest Enhancements	423
A.1.2	Remote Source-Route Bridging (in Features 7020 and 7070)	427
A.1.3	APPN Enhancements	428

A.1.4	TCP/IP Enhancements	428
A.1.5	Record/Play	429
A.1.6	Extended Language Support	429
A.1.7	Open Enterprise	429
A.2	Product Positioning	430
Appendix B.	APPN Overview	431
B.1	What Is APPN?	431
B.2	APPN and APPC	433
B.3	APPN Benefits	433
B.4	APPN Terminology	434
B.5	Names in SNA Networks	438
B.5.1	Network Identifiers	438
B.5.2	Network Names	438
B.5.3	Network-Qualified Names	438
B.6	Class of Service	438
B.6.1	COS Information for the Advanced User	439
B.6.2	COS Table Entries in APPN Networks	440
B.7	Specifying COS Characteristics	440
B.7.1	TG Characteristics	440
B.7.2	COS Names	442
B.7.3	COS Mode Names	442
B.7.4	Node Characteristics	442
B.7.5	Route Selection Using COS	443
B.8	SNA Node Types	444
B.9	Node and LU Types	445
B.9.1	LEN End Nodes	445
B.9.2	End Nodes	445
B.9.3	Network Nodes	446
B.9.4	LU Types	446
B.10	Independent versus Dependent Communications	447
Appendix C.	Interface Flows between APPN Nodes	449
C.1.1	APPN NNs Establishing CP-CP Sessions	450
C.1.2	APPN NN and APPN EN Establishing CP-CP Sessions	451
C.1.3	APPN Nodes Establishing an LU-LU Session	452
Appendix D.	3174 APPN Architecture Summary	455
Appendix E.	IBM Default COS Tables	461
E.1	#BATCH	461
E.2	#BATCHSC	463
E.3	#INTER	464
E.4	#INTERSC	466
E.5	#CONNECT	467
Appendix F.	Supplemental Information for Scenarios	469
F.1	NCP/NPSI Generation for SVC and PVC Links	469
F.2	Trace of DLUR/S Connection Flow	482
F.3	AS/400 and 3174 Border Node Exchange Traces	489
List of Abbreviations		493
Index		495

Figures

1.	Example of a Wildcard Routing to a Subarea Network	19
2.	Wildcard Enabled in a Single Link Multiple Host Environment	21
3.	Specific LU Definition with a Wildcard Path Defined	23
4.	Specific LU Definition with an Interchange Node	24
5.	Partial Wildcard Definition	26
6.	Explicit LU Definition in an SLMH Environment	28
7.	Backup Links Using Multitail	29
8.	Shared T2.0/2.1 Link Example	37
9.	Example of SSCP Takeover	39
10.	Dependent LU SSCP Connectivity without Dependent LU Requester/Server	43
11.	CP-SVR(CPSVRMGR) Pipe and Encapsulated SSCP-PU and SSCP-LU	44
12.	Relating Definitions Used in a Connection Network	49
13.	The 3174-11R DLUR Connectivity Display	51
14.	3270 Host Status Summary Panel	51
15.	Online Test 17 - APPN Test Menu	52
16.	Online Test 17,1 - Node Status	52
17.	Online Test 17,2 - Adjacent Nodes	53
18.	Online Test 17,3 - Link Status	53
19.	Online Test 17,4 - Display Session Status	54
20.	Online Test 17,5 - Display Pending Session Routes	54
21.	Online Test 17,6 - Display Active Locate Requests	55
22.	Local LU 6.2 Session Status	55
23.	Sample CONFIG.SYS	59
24.	Sample PROTOCOL.INI	59
25.	LAPS - Configure Workstation	61
26.	LAPS - Parameters for 3270 Adapter for 3174 Peer Communications	61
27.	3174 Peer Communication Function: Physical Configuration	63
28.	3174 Peer Communication Function: Logical View	63
29.	3174 Combined APPN and Peer Communication Function: Logical View	66
30.	3174 CS-C Customization Panel Flow Sequence	68
31.	3174 Customizing Master Menu	69
32.	Customizing Options	69
33.	Model/Attach Panel for CS-C Release 3	70
34.	Model/Attach Panel for Configuration Support-C Releases 4 and 5	70
35.	Local SNA Panel	72
36.	SDLC Panel	73
37.	Defining the X.25 Connection	74
38.	Defining the Frame Relay Connection	74
39.	Common SNA Panel	75
40.	APPN Node Definition Panel	78
41.	Links to Adjacent Nodes	82
42.	Qualifying the Network Resources for LEN-SSCP Connections	84
43.	Defining LUs to the 3174 Directory	84
44.	X.25 APPN Nodes	85
45.	COS Definition	88
46.	Correlating Mode Names with COS Table Names	90
47.	Enabling 3174 Peer Communication Functions	91
48.	Format of 3174-Peer Device Address	93
49.	Parameters for The Internal Bridge Function	95
50.	3174-Peer Bridge Parameters with Online Test Update	98

51.	LAN Manager Profile Panel	99
52.	X.25 APPN Nodes	99
53.	Shared T2.0/2.1 Link Support Example	111
54.	3174 NN with VTAM/APPN over Token-Ring	119
55.	The Switched Major Node Used for RAS - 3174 Connection	120
56.	The Network Node Server List for RAB	121
57.	VBUILD for RABAZ	121
58.	VBUILD for RASAZ	121
59.	VBUILD for RASAA	121
60.	Start Options to RAB	122
61.	Start Options to RAS	122
62.	3174 Common SNA Questions	123
63.	3174 APPN Node Definition Questions	123
64.	3174 Network Resource Definitions	124
65.	Associated LUs	124
66.	The Link Activation from RAS to 3174	125
67.	The NLDM List of Sessions Between RAS and CP31742	125
68.	D NET, NETSRVR Command Issued from RAB	126
69.	Topology Information of CP31742	126
70.	The NLDM Session List of RA74LUB	127
71.	The NLDM Session Configuration Data for RA74LUB	127
72.	The NLDM Session List for RABAZ	128
73.	Display of Nodes Adjacent to CP31742 Using Online Test 17,2	128
74.	Scenario Configuration	129
75.	NCP/VTAM Line, PU and LU Definition to the AS/400	131
76.	Network Attributes of the AS/400 (RALYAS4A)	132
77.	Line Description to CP3174 (LIN3174C3)	133
78.	Controller Description for CP3174 (CTL3174C3M)	134
79.	Device Description Coax-Attached Terminal (DEV3174C3M)	135
80.	Device Description Coax-Attached Terminal (DEV3174C33)	135
81.	Device Description for 5250 ILU (PS2ENCM)	136
82.	Device Description for 5250 ILU (DOSCOAX2)	136
83.	Device Description for SNASVCMG ILU (CP317400)	137
84.	Controller Description for DSPU PC/3270 (CTLDOSCOAX2)	137
85.	Device Description for 3270 Session (DEVDOCOAX2)	138
86.	Controller Description for DSPU CM/2 (CTLPS2ENCM)	138
87.	Device Description for 3270 Session (DEVPS2ENCM)	138
88.	SDLC Line Description to the Host (RA9L005)	139
89.	Controller Description (RA9P05)	139
90.	Upstream SNA Pass through Device Description (RA9T0506)	140
91.	Upstream SNA Pass through Device Description (RA9T0507)	140
92.	3174-11R Customization	141
93.	Customizing the 3174-11R for an SDLC Link	142
94.	Names to Identify the 3174-11R Network Node	142
95.	Token-Ring Definition for the 3174-11R	143
96.	Ring Address Assignment	143
97.	The 3174-11R Wildcard Option Is Disabled	144
98.	Network Resources	144
99.	Associated LUs	145
100.	Correlation of Mode and COS	145
101.	The Configure Workstation Panel	146
102.	Network Adapter Address	146
103.	LAN Adapter and Protocol Support (CONFIG.SYS)	147
104.	Communications Manager/2 Installation and Setup Version 1.0	148
105.	Configuration Definition Panel for 3270 Emulation	149

106.	3270 Emulation through Token-Ring	149
107.	Communication Manager Profile List Sheet	150
108.	Token-Ring or Other LAN Types DLC Adapter Parameters	150
109.	Communication Manager Profile List Sheet	151
110.	Local Node Characteristics	151
111.	Communication Manager Profile List Sheet	152
112.	Connections List	152
113.	Adapter List	153
114.	Change a Connection to a Network Node	153
115.	Communication Manager Profile List Sheet	154
116.	3270 Emulation	154
117.	Logical Terminal Configuration	155
118.	Communication Manager Configuration Definition Panel	156
119.	5250 Emulation Through Token-Ring	156
120.	Communication Manager Profile List Sheet	157
121.	Connections List	157
122.	Adapter List	158
123.	Change a Connection to a Network Node	158
124.	Communication Manager/2 (PSEN3174.NDF)	159
125.	Customize Communication	161
126.	Customize Communication - 3270 Host	162
127.	IEEE 802.2	162
128.	PC Support/400 Installation (PC to AS/400 Connection)	163
129.	PC Support/400 Installation (CONFIG.PCS) File	163
130.	Session Information	164
131.	Session Connection	164
132.	CONFIG.SYS for PC/3270 and PC Support Coexistence	165
133.	Display of Nodes Adjacent to the 3174-11R	165
134.	Configuration Status	166
135.	AS/400 Running SPLS Connected to VTAM via a 3174 GW	167
136.	VTAM Definitions for the 3174 Gateway	169
137.	GW 3174 Model/Attach Definitions	171
138.	GW 3174 Local SNA Definitions	171
139.	GW 3174 Common SNA Definitions	172
140.	GW 3174 Common Network Definitions	172
141.	GW 3174 Ring Address Assignment Definitions	172
142.	GW 3174 Ring Transmission Definition	173
143.	GW 3174 APPN Node Definition	173
144.	GW 3174 Network Resource Definitions	173
145.	GW 3174 COS Definitions	174
146.	GW 3174 Mode/COS Correlation Definitions	174
147.	AS/400 A Controller Definitions for SNA Primary LU2 Support	175
148.	AS/400 Device *CTLSSN Definitions for SNA Primary LU2 Support	175
149.	AS/400 B Controller Definitions for SNA Primary LU2 Support	176
150.	AS/400 B Device *CTLSSN Definitions for SNA Primary LU2 Support	176
151.	NetView Display of the 3174 Gateway PU	177
152.	NetView Display of the 3174 Gateway LU RAST4002	177
153.	NetView Display of the 3174 Gateway LU RAST4003	178
154.	NetView Display of the 3174 Gateway LU RALY3174	178
155.	NetView Display of the AS/400 PU	178
156.	NetView Display of the AS/400 SPLS LU	179
157.	Display Status of the 3174 Adjacent Nodes	179
158.	AS/400 Controller Display Status	179
159.	AS/400 Device RAST4601 in Session	180
160.	Patches for CS-C5 to Support SPLS	180

161.	Scenario Configuration	181
162.	3174-11L Customization	182
163.	Customizing the 3174-11L for a Local Token-Ring Gateway	183
164.	Names to Identify the 3174-11L Network Node	184
165.	Token-Ring Definition for the 3174-11L	184
166.	Ring Address Assignment	185
167.	Network Resources	185
168.	SNA Global Information	186
169.	Active Links Information	187
170.	Display LU 6.2 Session Information	187
171.	LU 6.2 Session Information	188
172.	Directory Information	190
173.	3174 DLUR with DDDL to VTAM DLUS	191
174.	Switched Major Node 3174 WMN DLUR and DDDL	193
175.	LU Group for DDDL	193
176.	Model/Attach Panel for 3174-43R WNM	194
177.	Token-Ring Description for 3174-43R	194
178.	LAN Attachment to Host Configuration	194
179.	Common SNA Selection to Enable 3174 APPN	195
180.	3174 APPN Node Definition	195
181.	Defining Adjacent Nodes	195
182.	Test 17 Option 2 - Adjacent Nodes	196
183.	Test 17 Option 3 - Link Status to VTAM	196
184.	Test 17 Option 7 - LU 6.2 Session with 3174 End Point	197
185.	Test 3 Option 1 - Status Summary for Direct Attached Devices	197
186.	Test 3 Option 5 - DLUR Connectivity Prior to BIND for Port 0	198
187.	Test 3 Option 5 - DLUR Connectivity Prior to BIND for Port 8	198
188.	Test 3 Option 3,0,26 - Connectivity for Port 0 with MLT	199
189.	NetView Display of Switched Major Node	199
190.	NetView Display of 3174 PU	199
191.	NetView Display of LU Group for DDDL	200
192.	NetView Display of the Topology for CP31745	200
193.	DLU to Host across APPN Network	201
194.	Defining the Model and Attachment Type	203
195.	Defining the Token-Ring Attachment	203
196.	Defining the SDLC Host Attachment	204
197.	The Common SNA Panel	205
198.	The Common Network Panel	205
199.	The APPN Node Definition Panel	206
200.	The Network Resources Panel	206
201.	The First Customization Panel	207
202.	The Token-Ring Description Panel	207
203.	The Local Area Network Panel 3174-13R	208
204.	The Common SNA Panel 3174-13R	208
205.	The APPN Node Definition Panel 3174-13R	209
206.	The Network Resources Panel 3174-13R	209
207.	VTAM Switch Major Node Definition for DLUR	210
208.	Line and Controller Definitions for CP31741	211
209.	CPSVRMGR Session Flow	213
210.	DLUR VTAM Status During Activation	213
211.	The 3270 Port Connectivity Menu	214
212.	The 3174-11R DLUR Connectivity Display	214
213.	The 3270 Host Status Panel	215
214.	The Session Status Panel	215
215.	Adjacent Nodes to the 3174-11R	216

216.	Sessions from the 3174-11R's Perspective	216
217.	The Session Status Panel	217
218.	The Session Status Panel	217
219.	VTAM Status After a Successful DLUR/DLUS Connection	218
220.	NLDM Session LU-LU session with DLUR/DLUS	219
221.	SLU to PLU in Host Not Containing DLUS	221
222.	VTAM SNA Major Node Connection of RAI to RAK	222
223.	The Adjacent Node Display for 3174-1	222
224.	The Adjacent Node Display for 3174-3	223
225.	The APPN Test Menu Panel	223
226.	Local LU 6.2 Sessions Display at 3174-3	223
227.	The APPN Test Menu Panel	224
228.	The APPN Test Menu Panel	224
229.	The APPN Test Menu Panel	225
230.	The 3174-11R DLUR Connectivity Display	225
231.	The 3270 Host Status Panel	226
232.	The Session Status Panel	226
233.	Border Node Support with DCAF	227
234.	The Common SNA Panel 3174-11R	229
235.	The Common SNA Panel 3174-13R Showing Different NETIDs	229
236.	AS/400 Line and Controller Description of CP31741	230
237.	AS/400 Line and Controller Description of CP31743	231
238.	Controlling DCAF	232
239.	Target DCAF	234
240.	DCAFMODE on the Target Workstation	235
241.	DCAF Transaction Program on the Target Workstation	236
242.	DCAF Additional TP Parameters on the Target Workstation	236
243.	The 3174-11R Adjacent Nodes Display	237
244.	3174-11R Session Status	238
245.	3174-11R LU 6.2 Session Status	238
246.	The 3174-13R Adjacent Nodes Display	239
247.	3174-13R Local LU 6.2 Session Status Display	239
248.	APPN across Frame Relay	241
249.	Defining the 3174 Frame Relay and Token-Ring Attachments	242
250.	Defining the Token-Ring	243
251.	Defining the Frame Relay Connection	243
252.	Common SNA Parameters to Enable 3174 APPN	244
253.	Defining the Number of DSPUs	244
254.	DSPU to Frame Relay Link Correlation	245
255.	Defining the LAN Attached DSPUs	246
256.	LAN Transmission Characteristics	246
257.	Frame Relay Parameters	247
258.	APPN Node Definition Panel	248
259.	Network Resources	248
260.	LUs Associated with LEN PCOM3270	249
261.	NCP Definition for the Frame Relay Link to the 3174	250
262.	AS/400 NCP Definition	251
263.	VTAM Switch Major Node Definition for Frame Relay with Gateway	252
264.	Line Definition for RAI	254
265.	Controller Definition for RAI	254
266.	PS/2 CM/2 PROTOCOL.INI File	255
267.	PS/2 CM/2 WTR32273.NDF File	256
268.	Personal Communications AS/400 and 3270 Version 4.0 for Windows Setup for a S/390 Host	257
269.	Link Configuration	257

270. Advanced Link Configuration	258
271. Personal Communications AS/400 and 3270 Version 4.0 for Windows Setup for an AS/400 Host	258
272. Customizing an AS/400 Connection	258
273. Link Configuration	259
274. DOS PS/2 PROTOCOL.INI File	259
275. DOS PS/2 CONFIG.SYS File	259
276. The Proof	260
277. The Frame Relay Test Menu	260
278. Frame Relay Port Summary Display	261
279. DLCI Status and Data Types	262
280. Status Summary for DLCI 0500	263
281. Link Status Summary for DLCI 0500 (Hex 01F4)	264
282. Link Status for All DLCIs Known to the 3174	265
283. 3270 Host Status Summary for Frame Relay	265
284. Gateway to Host Link Status	266
285. MLT Port Connectivity Status	266
286. Adjacent Nodes	267
287. Topology Summary Status of Adjacent CPs to RAI	267
288. Session Configuration between PCOM5250 and RALYAS4A	268
289. Session Configuration between PCOM5250 and RALYAS4A	268
290. AS/400 APPN End Point Sessions	268
291. X.25 with APPN	269
292. Model/Attach for X.25 to Host and Ethernet LAN	270
293. Ethernet Description for Downstream Links	271
294. X.25 Link Definition to the Host	271
295. Enabling 3174 APPN	272
296. X.25 Circuit Definitions for Host Link	272
297. X.25 Circuit Profiles for Adjacent Nodes	273
298. APPN Node Definitions for MS and DLUS	274
299. Defining Adjacent Nodes	274
300. Definition for X.25 Attached Adjacent Nodes	275
301. Associated LUs for RA5250	275
302. Model/Attach to Ethernet LAN	276
303. Ethernet Description for the 3741-14R	276
304. Ethernet LAN Definitions	277
305. Enabling 3174 APPN	277
306. APPN Node Definition for the 3174-14R	278
307. Defining Adjacent Nodes for the 3174-14R	278
308. SVC Portion to the NCP/NPSI Generation	279
309. The X.25 SVC Switched Major Node for Physical Link to CP31747	280
310. The X.25 SVC Switched Major Node for Virtual Link to CP31747	280
311. The X.25 SVC Switched Major Node Definition for CP31741	281
312. Line and Controller Definition for the AS/400	282
313. The Token-Ring Line and Controller Definition for RALYAS4A	283
314. PS/2 WTR42992 NDF File	284
315. DLUR Connectivity for 3174-11R	285
316. 3270 Host Status for X.25 Link	285
317. Adjacent Nodes	286
318. Local LU6.2 Sessions Status	286
319. Activate Locate Requests	287
320. DLUR Connectivity for 3174-14R	287
321. 3270 Host Status for 3174-14R	288
322. Adjacent Nodes for 3174-14R	288
323. No Active Locate Request for 3174-14R	288

324.	Local LU6.2 Session Status	289
325.	X.25 Circuit Definitions for Host Link	289
326.	X.25 Circuit Profiles to Adjacent Nodes	290
327.	APPN Node Definition	291
328.	X.25 APPN Nodes	291
329.	The X.25 PVC NCP Definition	292
330.	The VTAM Switch Major Node for a PVC DLUR/DLUS Connection	292
331.	DLUR Connectivity for Port 0, HG 26	293
332.	Adjacent Node Display for CP31747	293
333.	CP31747 Local LU 6.2 Session Status	294
334.	NetView Display of P08X01A	295
335.	VTAM Switched Major Node SW3174P2 Status	295
336.	NLDM Session Display	296
337.	The Verify Screens for PVC Connection of CP31747 to RAI	296
338.	Scenario Configuration	297
339.	Defining the 3174 SLMH over the ESCON Link	299
340.	Defining the Token-Ring	299
341.	Multi-Host panel	300
342.	Customizing the 3174-12L for a Local Token-Ring Gateway	300
343.	Names to Identify the 3174-12L Network Node	301
344.	Token-Ring Definition for the 3174-12L	301
345.	Ring Address Assignments	302
346.	LU Port Assignment Table	302
347.	Customizing the 3174-12L for a Second Local Token-Ring Gateway	303
348.	Common SNA	304
349.	Ring Address Assignments	304
350.	Post Assignment Table for Host 1B	305
351.	LU Assignments to CUT Terminal Ports	305
352.	APPN Node Definition Panel	306
353.	Network Resources	306
354.	Host Session Status /15	307
355.	APPN Test Menu	307
356.	Node Status Panel /17,1	308
357.	Adjacent Nodes Panel /17,2	308
358.	LINKID Test 1 from Previous Panel	309
359.	LINKID Test 3 from Adjacent Nodes Panel	309
360.	Session Status Panel /17,4	310
361.	LU 6.2 Session Status Panel /17,7	310
362.	VTAM Major Node Definition for Addresses 360-363 on 1A	311
363.	VTAM Major Node Definition for Addresses 380-383 on 1B	312
364.	Status of PU with VTAM	313
365.	Sessions with APING Partner LU	313
366.	NDF File for APPN and Multi-Host 3270 Sessions	314
367.	APING Statistics	315
368.	VTAM Logos from RAI (18) and RAK (20) from CM41992	315
369.	APPN MS Logical Environment	322
370.	Scenario Configuration	323
371.	Adding Focal Point NAME and NETID	325
372.	Online Test Panel /17,7	326
373.	Main NetView Entry Panel	326
374.	Main NPDA Entry panel	327
375.	Total Events NPDA Panel	327
376.	Display from 3174 CP31743	328
377.	Confirmation of Where MDS Alert Came From	328
378.	Detailed Display of Alert	329

379.	Event Detail Display	329
380.	Correlating Alert to 3174 Status Log	330
381.	Displaying VTAM NetView LU on RA3	330
382.	Scenario Configuration	331
383.	Adding Focal Point NAME and NETID	332
384.	Online Test Panel /17,7	333
385.	Main NetView Entry Panel	334
386.	Main NPDA Entry Panel	334
387.	Total Events NPDA Panel	335
388.	Most Recent Events Panel	335
389.	Detailed Display of Alert	336
390.	Event Detail Alert	336
391.	ALERTS-DYNAMIC DISPLAY from Main NPDA Options Panel	337
392.	Recommended Actions Display	337
393.	Correlating Alert to 3174 Status Log	338
394.	CP31743 Status with VTAM Host RAP	338
395.	RAP Host Status	339
396.	Scenario Configuration	340
397.	Adding Focal Point NAME and NETID	341
398.	Online Test Panel /17,7	342
399.	AS/400 Main Menu Display	342
400.	Main Alerts Display Panel	343
401.	First page of Detailed Alert	343
402.	Second Page of Detailed Alert	344
403.	Selecting Recommended Actions	344
404.	Recommended Actions Display	345
405.	Correlating Alert to 3174 Status Log	345
406.	Routing SNA, APPN and TCP/IP Traffic between 3174s	348
407.	List of CPNAME and MAC Addresses for Scenario 6	348
408.	3174 Peer and Bridges Menu Panel	350
409.	Selection for 3174 Peer and Source Route Remote Bridging	350
410.	3174 Peer Definition Panel	351
411.	Definition of Bridge and Segment Numbers	352
412.	Selecting LNM Support and/or 3174 Online Test Updates	352
413.	Configure Workstation Panel of LAPS	353
414.	Network Adapter Address for Peer	353
415.	APPC Definition for WS-D, Peer Communication	354
416.	Bridging SNA, APPN and TCP/IP Traffic between 3174s	356
417.	Logical View of Network	357
418.	3174 with Token-Ring as Host Attachment	358
419.	Definition for the 3174 Token-Ring	358
420.	3174 LAN Definitions	359
421.	Common SNA Panel	359
422.	Definition of Physical Link to the Frame Relay network	359
423.	APPN Node Definition without DLUR	360
424.	APPN Resource Definition	360
425.	3174 Peer and Bridges Options Panel	361
426.	3174 Peer Definition Panel	361
427.	Source Route Bridge Definition Panel	362
428.	Source Route Bridge Interfaces Panel	362
429.	Manual Spanning Tree Mode Panel	363
430.	Selecting LNM Support and/or 3174 Online Test Updates	363
431.	Common SNA Panel	364
432.	Definition of Physical Link to the Frame Relay network	364
433.	APPN Resource Definition	365

434.	3174 Peer and Bridges Options Panel	365
435.	3174 Peer Definition Panel	366
436.	Source Route Bridge Definition Panel	366
437.	Source Route Bridge Interfaces Panel	366
438.	Manual Spanning Tree Mode Panel	367
439.	Bridge Management Panel	367
440.	VTAM Switched Major Node for Bridged Network	368
441.	Frame Relay Link, DLCI Status	371
442.	Display 3174 Peer Status - HG 26	372
443.	Display 3174 Source Route Bridge Profile	372
444.	Display 3174 Bridge Port Information for Frame Relay (1 of 5)	373
445.	3174 Bridge Port Information for Frame Relay (2 of 5)	374
446.	3174 Bridge Port Information for Frame Relay (3 of 5)	374
447.	3174 Bridge Port Information for Frame Relay (4 of 5)	375
448.	3174 Bridge Port Information for Frame Relay (5 of 5)	376
449.	Display 3174 Bridge Port Information for Token-Ring	377
450.	Display 3174 Bridge Port Information for Peer	377
451.	Display LAN Manager Profile	378
452.	Display Bridge Filters - Receive	379
453.	Display 3174 Source Route Bridge Profile	380
454.	Display 3174 Bridge Port Information for Token-Ring	380
455.	3174 Bridge Port Information for Token-Ring	381
456.	CP-CP Sessions to Adjacent Nodes	383
457.	Intermediate Session Status Display Panel	383
458.	CP-CP Sessions to Adjacent Nodes	384
459.	Intermediate Session Status Display Panel	384
460.	Logical Links, WS-C	384
461.	LU6.2 Sessions, WS-C	385
462.	Logical Links, WS-D	385
463.	LU6.2 Sessions, WS-D	385
464.	PU Display for 3174-13R	386
465.	PU Display for 3174-43R	386
466.	PU Display for WS-C	387
467.	PU Display for WS-D	387
468.	NetView DM/2 Remote Administrator and 3174 Establishment Network Controller	389
469.	LAN Adapter and Protocol Support PROTOCOL.INI File (Remote Administrator Workstation)	391
470.	LAN Adapter and Protocol Support PROTOCOL.INI File (CC Server)	393
471.	The Local Node Characteristics Window	394
472.	The Local Node Options Window	394
473.	The Connections List Window	395
474.	The Connection to a Peer Node Window	395
475.	The Partner LU Window	396
476.	The Local LU Window	396
477.	The Mode Definition Window	397
478.	The Transaction Program Window (SEND)	398
479.	The Transaction Program Window (RECEIVE)	398
480.	Communications Manager Network Definition File (Remote Administrator Workstation)	399
481.	Communications Manager Network Definition File (CC Server)	403
482.	Base and Server Features Installation Window - Remote Administrator	406
483.	Base and Server Features Installation Window - CC Server	407
484.	Base and Server Features Installation Window (Configuration) - CC Server	408

485.	NetView DM/2 INI File (Remote Administrator Workstation)	408
486.	NetView DM/2 INI File (CC Server)	409
487.	The Open Node Window	410
488.	The New Node Window	410
489.	The New Node Window	411
490.	3174 - Attachment Menu	412
491.	3174 - Token-Ring Description Menu	413
492.	3174 - Common SNA Menu	413
493.	3174 - Token-Ring Description Menu	414
494.	3174 - Common SNA Menu	415
495.	NetView DM/2 Catalog Window	416
496.	Retrieve the New Functional Release of 3174 Utility Microcode	417
497.	Retrieve Options Window	417
498.	Send the New Functional Release of 3174 Utility Microcode	418
499.	Install the New Functional Release of 3174 Utility Microcode	419
500.	The Installed Objects Window	420
501.	Activate Window	420
502.	APPN NNs Establishing Parallel CP-CP Sessions	450
503.	APPN NN and APPN EN Establishing Parallel CP-CP Sessions	451
504.	APPN Nodes Establishing an LU-LU 6.2 Session in a Connection Network	452
505.	IBM-Supplied Node Definition Defaults - #BATCH	461
506.	IBM-Supplied TG Definition Defaults - #BATCH	462
507.	IBM-Supplied TG Definition Continued Defaults - #BATCH	462
508.	IBM-Supplied Node Definition Defaults - #BATCHSC	463
509.	IBM-Supplied TG Definition Defaults - #BATCHSC	463
510.	IBM-Supplied TG Definition Continued Defaults - #BATCHSC	464
511.	IBM-Supplied Node Definition Defaults - #INTER	464
512.	IBM-Supplied TG Definition Defaults - #INTER	465
513.	IBM-Supplied TG Definition Continued Defaults - #INTER	465
514.	IBM-Supplied Node Definition Defaults - #INTERSC	466
515.	IBM-Supplied TG Definition Defaults - #INTERSC	466
516.	IBM-Supplied TG Definition Continued Defaults - #INTERSC	467
517.	IBM-Supplied Node Definition Defaults - #CONNECT	467
518.	IBM-Supplied TG Definition Defaults - #CONNECT	468
519.	IBM-Supplied TG Definition Continued Defaults - #CONNECT	468
520.	NCP/NPSI Definitions	469
521.	Trace of DLUR/S Flows	483
522.	Border Node Trace Entries Between RALYAS4A and CP31743	489

Tables

1.	Functions and Level of Support in the 3174 NN	6
2.	Supported Connectivity	10
3.	3174 SLMH Support in an APPN Environment	20
4.	3174 XID Processing Prior to CS-C Release 3	31
5.	3174 XID Processing in Release C3 and Later	31
6.	Explicit Link Initiation	32
7.	APPN Sessions Using Question 610	79
8.	Nodes and Links Specified Using Question 611	79
9.	3174-Peer Online Test Updates Allowed	93
10.	APPN Additional Storage Requirements (KB)	102
11.	Peer Communication Additional Storage Requirements (KB)	102
12.	APPN and Peer Communication LIC Feature Numbers	105
13.	PTFs Required for DLUR/DLUS via AS/400 Intermediate Node	116
14.	OS/400 APARs for 3174 APPN	116
15.	Relationship between Q510, Q511 and Q502	414
16.	Microcode Support Level, Supported LU 6.2 Types and Needed Patches	421
17.	Some SNA Node Types and Examples	444
18.	APPN Architecture Support in the 3174 NN	455
19.	Frame and Description Table	487
20.	Trace Table Entries and Analysis	491

Special Notices

This publication is intended to help IBM and customer system engineers, system planners, system programmers and network administrators implement the Advanced Peer-to-Peer Networking (APPN) and Peer Communication functions provided by the 3174 Establishment Controller Configuration Support-C Licensed Internal Code (LIC). The information in this publication is not intended as the specification of any programming interfaces that are provided by 3174 Establishment Controller Configuration Support-C Licensed Internal Code (LIC). See the PUBLICATIONS section of the IBM Product Announcement (193-121) for the IBM 3174 Establishment Controller Networking Enhancements for more information about what publications are considered to be product documentation.

References in this publication to IBM products, programs or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent program that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program or service.

Information in this book was developed in conjunction with use of the equipment specified, and is limited in application to those specific hardware and software products and levels.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Licensing, IBM Corporation, 500 Columbus Avenue, Thornwood, NY 10594 USA.

The information contained in this document has not been submitted to any formal IBM test and is distributed AS IS. The information about non-IBM (VENDOR) products in this manual has been supplied by the vendor and IBM assumes no responsibility for its accuracy or completeness. The use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment. While each item may have been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will be obtained elsewhere. Customers attempting to adapt these techniques to their own environments do so at their own risk.

The following document contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples contain the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Reference to PTF numbers that have not been released through the normal distribution process does not imply general availability. The purpose of including these reference numbers is to alert IBM customers to specific information relative to the implementation of the PTF when it becomes available to each customer according to the normal IBM PTF distribution process.

The following terms are trademarks of the International Business Machines Corporation in the United States and/or other countries:

ACF/VTAM	Advanced Peer-to-Peer Networking
AIX	APPN
AS/400	AT
CICS	CICS/6000
CUA	ES/9370
ESCON	Extended Services
IBM	Information Assistant
LPDA	MVS/ESA
MVS/SP	MVS/XA
NetView	OS/2
OS/400	POWERparallel
PS/2	RS/6000
RT	S/370
S/390	System/370
VTAM	400

The following terms are trademarks of other companies:

Windows is a trademark of Microsoft Corporation.

PC Direct is a trademark of Ziff Communications Company and is used by IBM Corporation under license.

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited.

C-bus is a trademark of Corollary, Inc.

X/Open	X/Open Company Limited
NDIS	3Com Corporation and Microsoft Corporation
Novell, NetWare, IPX	Novell, Incorporated
RUMBA	Wall Data Incorporated
386	Intel Corporation
IDNX	Network Equipment Technologies, Incorporated
DCE	The Open Software Foundation

Other trademarks are trademarks of their respective companies.

Preface

This document describes the enhancements to 3174 Configuration Support-C Advanced Peer-to-Peer Networking (APPN) feature, since Release 2. The focus is on implementing the 3174 Establishment Controller Configuration Support-C Release 3,4,5 and 6 Licensed Internal Code (LIC) in APPN network scenarios involving APPN VTAM, Communications Manager/2, AIX SNA Services Version 2.1, AS/400 and PC Support/400. Scenarios are used to emphasize the 3174 APPN support over LAN (token-ring and Ethernet), SDLC, channel, Peer Communications (LAN over coax), X.25, Frame Relay and ESCON.

This document is intended for IBM and customer system engineers, system planners, system programmers and network administrators who need to know how to customize the 3174 for APPN and Peer Communication functions and relate the customization responses to the various IBM products mentioned previously. A working knowledge of SNA VTAM communication, APPN, PC Support/400, OS/400, and Communications Manager/2 is assumed.

3174 APPN Implementation Guide, GG24-3072 is the predecessor to the first edition of GG24-4171-00 and should be used as an additional guide, specifically when earlier versions of 3174 Configuration Support-C LIC are involved.

How This Document is Organized

The document is organized as follows:

- Chapter 1, "3174 APPN Implementation" on page 1 describes the 3174 implementation as an APPN network node.
- Chapter 2, "3174 Peer Communication with APPN" on page 57 provides an overview of 3174 Peer Communications. The main focus of this chapter is the workstation considerations for Peer Communications for the DOS and OS/2 environments.
- Chapter 3, "3174 APPN and Peer Communication Customization" on page 67 describes in detail the responses required during 3174 customization to implement the 3174 APPN and Peer Communication functions.
- Chapter 4, "Hardware and Software Requirements" on page 101 contains the requirements for 3174 APPN support.
- Chapter 5, "APPN VTAM Considerations" on page 107 is a compilation of considerations for using the APPN capabilities of VTAM Version 4 Release 1.
- Chapter 6, "AS/400 Considerations" on page 115 is a compilation of considerations for using the 3174 in a network that involves AS/400s.
- Chapter 7, "Personal Systems/2 Considerations" on page 117 describes the PS/2 communications software that is used in different scenarios throughout this document.
- Chapter 8, "3174 NN with VTAM APPN Nodes (Token-Ring)" on page 119 puts to practice the notion of 3174 NN and APPN/VTAM interoperability.
- Chapter 9, "3174 via Shared SDLC Link to an AS/400" on page 129 shows a PS/2 EN utilizing a 3174-11R NN to communicate to an AS/400 NN and subarea node simultaneously. The emphasis here is on the support of APPN via SDLC using a 3174 NN.

- Chapter 10, “SNA Primary LU2 Support (SPLS) via a 3174 GW” on page 167 illustrates the ability of the 3174 gateway and network node to support APPN over a parallel channel.
- Chapter 11, “RS/6000 NN via 3174-11L to RS/6000 NN” on page 181 shows the capability of an RS/6000 NN utilizing a 3174 NN to communicate to another RS/6000 NN. The emphasis here is on the support of APPN via AIX SNA Services V2R1 using a 3174 NN as server.
- Chapter 12, “Using DLUR with DDDL” on page 191 examines using the 3174 DLUR function with the Dynamic Definition of Dependent LUs, showing you how to define only the 3174 PU in the VTAM definitions, and allowing all LUs definitions to be created dynamically.
- Chapter 13, “DLUR-DLUS and PLU on the Same Host” on page 201 shows the customization required to implement DLUR and DLUS with the 3174. This implementation allows concurrent support of dependent LUs together with independent LUs without the requirement of T2.0 traffic on the host link.
- Chapter 14, “DLUR with DLUS and PLU on Different Hosts” on page 221 discusses a scenario used to demonstrate that the LU to LU session need not be with the same host as the SSCP to LU session. With the DLUR function the 3174 can be attached anywhere in the network rather than directly to the subarea node.
- Chapter 15, “Border Node Support via the AS/400” on page 227 shows the 3174 NN providing the border node coexistence support using Configuration Support-C5 while the border node function is provided by an AS/400 NN with OS/400 V2.1.
- Chapter 16, “APPN over Frame Relay” on page 241 describes an environment using the 3174 APPN support for Frame Relay.
- Chapter 17, “APPN over X.25” on page 269 describes the 3174 APPN support over an X.25 network. Here we demonstrate the coexistence of dependent LUs and APPN ENs over the same X.25 link.
- Chapter 18, “APPN over 3174 ESCON Channel Connection” on page 297 describes the 3174 APPN support over an ESCON channel connection. We show the setup of an SLMH connection to two hosts for 3270 sessions and for APPN independent sessions.
- Chapter 19, “APPN Management Services Support and Scenarios” on page 317 describes the key concepts of the MS architecture for APPN nodes.
- Chapter 20, “3174 APPN with Peer Communications and Bridging” on page 347 shows APPN over Peer and Bridged networks plus scenarios.
- Chapter 21, “3174 CSCM Using NetView Distribution Manager/2” on page 389 illustrates the use of the NetView DM/2 as a remote administrator workstation of 3174 Central Site Change Management network and central site controllers using APPN and an independent LU6.2 session.
- Appendix A, “3174 APPN Newest Enhancements” on page 423 provides a brief overview of the newest and planned enhancements to the 3174 in APPN networks.
- Appendix B, “APPN Overview” on page 431 provides a brief overview of APPN and is not intended to be product specific.
- Appendix C, “Interface Flows between APPN Nodes” on page 449 explains briefly the session establishment between control points (CP-CP sessions) and between LUs (LU-LU session) in an APPN network.

- Appendix D, “3174 APPN Architecture Summary” on page 455 shows a table with the APPN Architecture support in the 3174 network node, referred to each Configuration Support release level: C1, C2, C3, C4, C5 and C6.
- Appendix E, “IBM Default COS Tables” on page 461 shows the COS tables provided with Configuration Support-C for APPN functions.
- Appendix F, “Supplemental Information for Scenarios” on page 469 provides information that complements the scenarios included in this document.

Related Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this document.

- *3174 Establishment Controller Functional Description*, GA23-0218
- *3174 Establishment Controller Configuration Support-C Planning Guide*, GA27-3918
- *3174 Establishment Controller Configuration Support-C Utilities Guide*, GA27-3920
- *3174 Establishment Controller Supplemental Information for Configuration Support-C Release 4*, GA27-3994
- *3174 Establishment Controller Status Codes*, GA27-3832
- *3174 Establishment Controller Customer Problem Determination*, GA23-0217
- *8250 Workstation Networking Module Installation and Customization Guide*, GA27-4022
- *SNA APPN and LEN Architecture Reference*, SC30-3422
- *SNA Formats*, GA27-3136

International Technical Support Organization Publications

- *APPN Architecture and Product Presentation Tutorial*, GG24-3669
- *3174 Establishment Controller APPN Implementation Guide*, GG24-3702
- *AS/400 APPN Configuration Guide*, GG24-4023
- *3174 Establishment Controller/Networking Server Installation Guide*, GG24-3061
- *Using 3174 in TCP/IP Networks*, GG24-4172
- *NetView DM/2 V2.1 Remote Administrator and New Functions*, GG24-4419
- *3174 Network Server in Frame Relay and Multiprotocol Networks*, GG24-4376

A complete list of International Technical Support Center publications, with a brief description of each, may be found in:

Bibliography of International Technical Support Centers Technical Bulletins, GG24-3070.

To get a catalog of ITSO redbooks, VNET users may type:

TOOLS SENDTO WTSCPOK TOOLS REDBOOKS GET REDBOOKS CATALOG

A listing of all redbooks, sorted by category, may also be found on MKTTOOLS as ITSOCAT TXT. This package is updated monthly.

How to Order ITSO Redbooks

IBM employees in the USA may order ITSO books and CD-ROMs using PUBORDER. Customers in the USA may order by calling 1-800-879-2755 or by faxing 1-800-284-4721. Visa and MasterCard are accepted. Outside the USA, customers should contact their local IBM office. For guidance on ordering, send a PROFS note to BOOKSHOP at DKIBMVM1 or E-mail to bookshop@dk.ibm.com.

Customers may order hardcopy ITSO books individually or in customized sets, called BOFs, which relate to specific functions of interest. IBM employees and customers may also order ITSO books in online format on CD-ROM collections, which contain redbooks on a variety of products.

ITSO Redbooks on the World Wide Web (WWW)

Internet users may find information about redbooks on the ITSO World Wide Web home page. To access the ITSO Web pages, point your Web browser to the following URL:

<http://www.redbooks.ibm.com/redbooks>

IBM employees may access LIST3820s of redbooks as well. The internal Redbooks home page may be found at the following URL:

<http://w3.itsc.pok.ibm.com/redbooks/redbooks.html>

Acknowledgments

This project was designed and managed by:

Jose Boo Sanchez
International Technical Support Organization, Raleigh

The authors of this document are:

John Ricci
IBM Canada

Jose Boo Sanchez
International Technical Support Organization, Raleigh

This publication is the result of a residency conducted at the International Technical Support Organization, Raleigh.

Thanks to the following people for the invaluable advice and guidance provided in the production of this document:

Franchesca Collins
Carla Sadtler
International Technical Support Organization, Raleigh

Marilyn Beumeler
Bill Chambers
3174 Development
Research Triangle Park, Raleigh

Gail Wojton
John Dettelbach
International Technical Support Organization, Raleigh

First Edition

Thanks also to the following people for their contributions to the earlier edition of this document:

Jose Boo Sanchez, advisor, IBM Raleigh
Francesca Collins, advisor, IBM Raleigh

Manuel Ducut, author, IBM Philippines
Richard Fairhurst, author, IBM United Kingdom

Chapter 1. 3174 APPN Implementation

January 1991 marked the beginning of the 3174's ability to participate in APPN networks. 3174 Establishment Controller Configuration Support-C Licensed Internal Code (LIC) was announced as the microcode required to configure the 3174 as an APPN network node, as well as a Peer Communications (LAN over coax) server for coax-attached workstations requiring participation as a LAN workstation. All APPN nodes requiring the services of the 3174 network node had to reside either on the LAN or directly attached as a Peer Communications (LAN over coax) device.

Since that time, there have been major enhancements in the 3174 APPN implementation in the areas of connectivity and functionality.

Configuration Support-C Release 6: In December 1994, the Configuration Support-C Release 6 for the 3174 Establishment Controller was announced. IBM extends the functional capabilities of the 3174 Establishment Controller with Configuration Support-C Release 6 Licensed Internal Code (LIC) that enhances support for APPN, TCP/IP, and the Frame Relay Communications feature. Configuration Support-C Release 6 includes all functions of CS-C Release 5 and many new and improved functional enhancements.

- **Base microcode**

releases of microcode plus the following enhancements:

- Record/Play
- Extended Language support

- **APPN**

The 3174 APPN LIC feature enhancements include:

- Support for up to eight ESCON channel connections.
With the ESCON Director, the 3174 can have T2.1 link capability for up to eight host connections, improving the connectivity to S/390 and POWERparallel processors.
- Safe storage of the APPN topology database of a hard file is available.

- **Frame Relay Communications LIC Feature**

The Frame Relay Communications feature is extended to provide source-route remote bridging. It expands your networking opportunities by interconnecting token-ring local area networks (LANs) across a wide area network (WAN) with speeds of up to 256 kilobits per second. Multipoint bridging expands the 3174 bridging function to allow source-routed traffic access to any combination of three ports: token-ring, frame relay or Peer Communication (coax attachment). Remote source-route bridging uses frame relay to enable the 3174 bridge to attach token-ring and peer segments to remote token-ring and peer segments.

- **TCP/IP**

IP Router provides static routing between a LAN and a frame relay network for TCP/IP devices. IP routing allows devices on the LAN and the frame relay network to send IP datagrams to the 3174 with an IP destination address other than the 3174's IP address. The 3174 performs basic IP routing using customized, static routes to forward the datagram as appropriate.

TCP/IP is enhanced to include the TN3270 protocol and MIB-II variables for SNMP and to support printers using Line Printer Daemon (LPD) server.

Configuration Support-C Release 5: In February 1994, the 3174 Establishment Controller Configuration Support-C Release 5 Licensed Internal Code (LIC) for the 3174 Establishment Controller was announced. 3174 Establishment Controller Configuration Support-C Release 5 merges all functions that are currently available with 3174 Establishment Controller Configuration Support-C Release 3 and 4 Licensed Internal Code (LIC) while greatly enhancing the APPN and connectivity options of the 3174.

The APPN extensions provided by Configuration Support-C5 increase your ability to build and interconnect complex, vertical, and multi-vendored networks.

Configuration Support-C5 consists of the following components:

- **Base microcode**

The base microcode incorporates the base functions of previous releases of microcode plus the following enhancements:

- Speed of WAN communications (frame relay, and SDLC) up to 256 Kbps
- ASCII Multiple Host support
- Printer MLT
- Enhanced 5250 Emulation support
- Multiple CECF language support
- PS/55--3174 printer sharing

- **Frame Relay Communications LIC feature**

The Frame Relay Networking LIC feature is separately orderable with-charge feature.

This new feature expands 3174 connectivity by providing frame relay communications support. The existing 3174 multiprotocol communications such as SNA 3270, LAN Gateway, APPN, and TCP/IP are all supported over frame relay.

Note: See the ITSO document *3174 Network Server in Frame Relay and Multiprotocol Networks*, GG24-4376 to learn more about how 3174 frame relay communications can be implemented in various scenarios.

- **Peer Communication LIC feature**

The Peer Communication LIC feature is pre-merged onto the control extension diskette as a no-charge feature.

- **Advanced Peer-to-Peer Networking LIC feature**

The Advanced Peer-to-Peer Networking LIC feature is pre-merged as a no-charge feature that includes the following enhancements:

- Dependent LU Requester (DLUR)

DLUR protects your investment in dependent displays while allowing you to take advantage of APPN route selection. VTAM Version 4 Release 2 Dependent LU Server is required on the host.

- Management Services LU 6.2 Support

Management Services LU 6.2 Support removes the need for the 3174 to be boundary-attached to the host system for network management. The 3174 with Configuration Support-C5 can communicate with an APPN Focal Point via an LU 6.2 session, versus the SSCP-PU session.

- Border node interoperability

- APPN over X.25

- APPN over Frame Relay (requires the frame relay feature)

- APPN Central Directory Client Support

- APPN Non-LAN Customization

The Configuration Support-C Release 5 APPN feature removes the requirement for a LAN adapter for the APPN feature; that is, the 3174 can be customized as an APPN network node (NN) without a LAN adapter installed.

Configuration Support-C Release 4: 3174 Establishment Controller Configuration Support-C Release 4, announced in May 1993, fulfills the Statement of General Direction (SOD) for Ethernet support, dated September 15, 1992. IBM provides a 3174 Ethernet adapter and corresponding microcode (Configuration Support-C Release 4) which will support APPN, Downstream Physical Unit (DSPU), and Gateway connectivity configurations analogous to those currently available for token-ring with Configuration Support-C3. The Ethernet adapter is intended to support both Systems Network Architecture (SNA) and Transmission Control Protocol/Internet Protocol (TCP/IP) protocols. DSPU support provides upstream Ethernet local area network (LAN) accessibility for dependent workstations attached to a 3174 via 3270 wiring media (this does not include Peer Communications (LAN over coax) attached IWSs). The gateway support provides SNA host access for devices attached downstream from a 3174 via an Ethernet LAN.

Configuration Support-C4 consists of the following components:

- **Base microcode**

The base microcode incorporates the base functions of previous releases of microcode plus the following enhancement:

- Ethernet LAN support

- **Peer Communication LIC feature**

The Peer Communication LIC feature is a separately orderable no-charge feature. There is no Peer Communications (LAN over coax) bridge support available with Configuration Support-C4 and associated Ethernet adapter; thus, communications are limited to other directly attached Peer Communications (LAN over coax) devices.

- **Advanced Peer-to-Peer Networking LIC feature**

The Advanced Peer-to-Peer Networking LIC feature is a separately orderable no-charge feature that includes the following feature:

- Ethernet links to other APPN and LEN nodes

RPQ 8Q1041 (TCP Enhancements): This RPQ, based on Configuration Support-C4, provides TCP/IP enhancements in the area of access to 3270 applications in full screen mode, printing from TCP/IP host and SNMP MIB II support. One of the by-products of this RPQ is the ability to customize your LAN access as token-ring, Ethernet or none. Since this RPQ is a Control Disk RPQ, your APPN nodes can take advantage of the ability to select any LAN adapter type from a single microcode release.

Configuration Support-C Release 3: In May 1993, Configuration Support-C Release 3.0 Licensed Internal Code (LIC) for the 3174 Establishment Controller was announced. 3174 Establishment Controller Configuration Support-C Release 3 builds on the Advanced Peer-to-Peer Networking (APPN) and Peer Communications (LAN over coax) capabilities of Configuration Support-C2.

Configuration Support-C3 consists of the following components:

- **Base microcode**

The base microcode incorporates the base functions of the previous releases of microcode plus the following enhancement:

- Integration of TCP/IP TELNET support (RPQ 8Q0935)
- Concurrent Communications Adapter (CCA) support of 64 ports
- Percent and hexadecimal capabilities for the calculator
- HAP printer assignment to any primary host link (SLMH)

- **Peer Communication LIC feature**

The Peer Communication LIC feature is a separately orderable no-charge feature, with enhancements that allow the wrap mode to be selected at customization time. It is necessary to place the 3174-Peer Communications (LAN over coax) bridge in *wrap* mode for the 3174 Peer Communications (LAN over coax) devices to access the host via a 3174 gateway WAN link(s).

- **Advanced Peer-to-Peer Networking LIC feature**

The Advanced Peer-to-Peer Networking LIC feature is a separately orderable no-charge feature:

- 3174 APPN network node (NN) compatibility in environments where the APPN host is an end node (EN), network node (NN), migration data host (MDH) or an interchange node (IN)
- SDLC link and parallel channel APPN connections to VTAM/NCP
- Support for multiple links to a LEN subarea from an APPN network comprised of 3174s and other APPN nodes
- Support for the transport of 3270 and APPN data streams across a single SDLC or token-ring to an AS/400
- Dynamic upgrade of explicit DSPU (T2.0) links to shared DSPU/APPN (T2.0/T2.1) links

Configuration Support-C Release 2: In March 1992, Configuration Support-C2 was announced. As far as APPN is concerned, there was no change in function or connectivity over what was available in Configuration Support-C1.

Configuration Support-C Release 1: The 3174 Configuration Support-C Release 1 consists of the following components:

- **Base microcode**

The base microcode incorporates the base functions of previous releases of microcode, with enhancements to support the 3174 Integrated Services Digital Network Basic Rate Interface Adapter (ISDN BRI).

- **Peer Communication LIC feature**

The Peer Communication LIC feature is a separately orderable no-charge feature, which integrates 3174 Peer Communication RPQ 8Q0718 and enables workstations that are attached via 3270 wiring to the 3174 to participate as local area network workstations.

- **Advanced Peer-to-Peer Networking (APPN) LIC feature**

The Advanced Peer-to-Peer Networking LIC feature is a separately orderable no-charge feature, which adds APPN network node and T2.1 capabilities to the 3174.

Note: For convenience, 3174 Establishment Controller Configuration Support-C Licensed Internal Code (LIC) will be referred to as Configuration Support-C (followed by the release level) in the remainder of this document.

1.1 Functions and Levels of Support

Table 1 lists the functions and the levels of support in the 3174 APPN implementation. This table can be read by finding a function in the left-hand column and looking at the corresponding right-hand column to determine if or how that function is supported.

See also Appendix D, "3174 APPN Architecture Summary" on page 455, which shows a table with the APPN Architecture support in the 3174 network node for each release level: C1, C2, C3, C4, C5 and C6.

Table 1 (Page 1 of 2). Functions and Level of Support in the 3174 NN

Function	3174 APPN Network Node Implementation
T2.1 Links Supported Token-ring to Host Ethernet to Host TP-SDLC to Host S/370 Channel to Host ESCON Channel to Host X.25 (PVC and SVC) to Host Frame Relay to Host X.21 Leased X.21 Switched ISDN Frame Relay or X.25 to other nodes and 3174 SDLC to another 3174 SDLC to an AS/400 Token-ring to APPN nodes Ethernet to APPN nodes 3174-Peer APPN nodes	Models 3R, 13R, 23R, 53R, 63R, 43R(WNM) Models 14R, 24R, 64R (CS-C4 and later) Models 1R, 2R, 11R, 12R, 21R, 51R, 61R, 62R, 41R(WNM) Models 1L, 11L, 21L, 21H Available in CS-C6 Available in CS-C5 Available in CS-C5 Available in CS-C5 Not Supported Not Supported, T2.0 only, can coexist Available in CS-C5 Not Supported Supported Supported Supported (CS-C4+) Requires Peer Communications (LAN over coax) feature and bridge (limited to Peer Communications (LAN over coax) nodes for CS-C4)
3174 Functions Customizing CSCM CSCU Microcode Upgrade Online Tests CSCF by PU-SSCP DSL Merge De-configure PU2.0 LU 1, 2, 3 Peer Communications (LAN over coax) LAN (token-ring and Ethernet) gateway Other Configuration C Functions	Yes Yes, dependent/independent LU support Yes Yes, prior configuration to C Enhanced /17 APPN Tests Yes Yes for APPN; Yes for Peer Communications (LAN over coax) Yes Required for Network Management and Dependent LUs Shared Link to Host (DLUR in CS-C5) Optional, required for 3174-Peer Nodes Optional, required for Shared Link to DSPUs No change, can coexist

Table 1 (Page 2 of 2). Functions and Level of Support in the 3174 NN

Function	3174 APPN Network Node Implementation
APPN Functions NN Base Functions Control point Intermediate Session Routing LU 6.2 Services CPNAME = LUNAME Connection Network BIND Segment and Reassembly BIND Pacing (Independent LUs) Transmission Priority Parallel TG Multiple TG Multi-link (Multitail) LEN Subarea Routing Shared Link to LEN/APPN Host Shared Link to Downstream Node on T2.1 Link Safe Store of Directory Services cache Network Operator Facility Routing to Different APPN NETIDs Border node Node Function Interoperability SSCP Takeover Participation CP Name change TG number change Dependent LU Requester	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes, full wildcard, generic and specific naming Yes Yes Yes, if fixed disk is available Offline, by customizing Yes, to Subarea and APPN EN To border node available in CS-C5 No Available in CS-C5 Yes Yes Yes Available in CS-C5
Network Management Generic alerts APPN NN receives alerts from APPN EN APPN NN sends alerts to NetView APPN NN sends alerts to focal point APPN NN receives alerts from LEN Node Pseudo Focal Point for APPN EN CP-Focal Point Session Multiple Domain Support (MDS) Transport	Yes Yes, by CP-CP Session Yes, by PU-SSCP Session (or CP-Focal Point session, available in CS-C5) Available in CS-C5 None in APPN; LEN can use gateway function for PU-SSCP session Yes Available in CS-C5 Available in CS-C5

1.2 3174 APPN LIC Feature Connectivity

The 3174 APPN LIC feature, together with 3174 Configuration Support-C base microcode, allows the 3174 to behave as an APPN network node. This implementation does not allow the 3174 to be customized for any other APPN node type; that is, the 3174 can only be a network node. This means that the 3174 is likely to provide network node services for other APPN nodes with end user (programs) interfaces. The physical link or protocol that exists between the 3174 and adjacent nodes has limitations based on the node and link type, as well as the release microcode running on the 3174. In this section, we address the links and products that are supported by the 3174 as a network node.

1.2.1 Supported Links

The 3174 network node supports links to other APPN network nodes, APPN end nodes and LEN nodes.

Configuration Support-C Release 6 maintains all of the link types supported in previous releases on Configuration Support-C plus the support of APPN over ESCON.

Configuration Support-C Release 5 maintains all of the link types supported in previous releases on Configuration Support-C while fulfilling the Statement of General Direction (May 16, 1993) 193-121 for support of APPN over:

- X.25 connections
- X.21 leased (up to 256 Kbps)
- Frame relay

Statement of General Direction (May 16, 1993) 193-121

IBM intends to enhance the networking capabilities of the 3174 Establishment Controller by providing support for frame relay communications. The enhancements will do the following:

- Allow 3174 inter-connectivity with frame relay implementations offered by IBM products such as the 3745 and NCP, and OEM products.
- Enable customers to connect to a frame relay network for transport of multiple protocols using either public or private facilities.
- Allow customers to take advantage of the usage-based tariff structure of frame relay, versus leased communications lines.

IBM also plans to enhance the 3174's APPN capabilities to provide support for APPN communications across an ESCON channel.

Prior to Configuration Support-C5 the links supported by the 3174 were:

- For subarea:
 - Connection to a subarea network as an NN, EN or LEN node using SDLC, LAN (token-ring and Ethernet) or parallel channel attachments
- For non-subarea nodes:
 - Connection to NN, EN and LEN nodes via LAN (token-ring and Ethernet) or SDLC

Note: SDLC connections are limited to nodes that have primary link station support (subarea, AS/400 and some routers).

- Connection to NN, EN and LEN nodes via coax

To support APPN nodes via coax attachment to the 3174 NN requires the Peer Communication LIC feature in the 3174 and the LAN-over-Coax device drivers in DOS and OS/2 workstations.

See 2.1, “Peer Workstation Requirements” on page 57 for workstation software requirements.

Because 3174 NNs allow T2.1 traffic to share a single link with T2.0 traffic, multiple subchannel addresses or multi-drop links are not needed for T2.1 traffic.

1.2.2 Unsupported Links

The following physical links remain unsupported by the 3174 network node running Configuration Support-C:

- Communication over X.21 switched connections
- Communication through the Concurrent Communication Adapter or ISDN Basic Rate Interface adapter

Notes

Configuration Support-C6 adds support for APPN over ESCON and Remote Source Route Bridging.

1. VM/SP does not support an SDLC T2.1 connection.
2. The ES/9370 with the Telecommunications Subsystem Controller and the multiprotocol two-line communication adapter (feature number 6031, VM/SP only) requires the engineering change (EC) A48290 for direct connection of type 2.1 nodes through SDLC links.
3. Support for connectivity to other LEN/APPN products, other than those mentioned in Table 2 on page 10, are considered on an RPQ basis.

1.2.3 3174 APPN Connectivity Summary

Table 2 summarizes the connectivity supported by the 3174 APPN LIC feature. The first column lists the various IBM products which are supported by the APPN LIC feature. The second column lists the types of connections that are supported for each product. The third column indicates the node type(s) supported for the connection type; an X indicates that a node type is supported.

<i>Table 2. Supported Connectivity</i>				
Product Supported	Connection Type	Node Type		
		LEN	EN	NN
3174 Configuration Support-C 1,2,3,5 and 6	Token-Ring	-	-	X
3174 Configuration Support-C 4,5 and 6	Ethernet	-	-	X
3174 Configuration Support-C 5 and 6	X.25 and Frame Relay	-	-	X
AS/400	LAN (token-ring and Ethernet), X.25, SDLC and Frame Relay	X	X	X
DPPX/370 R3	Token-Ring	X	X	X
Networking Services/2	LAN (token-ring and Ethernet) and X.25	X	X	X
OS/2 EE V1.2, V1.3, or Japanese V1.2	LAN (token-ring and Ethernet) and X.25	X	-	-
OS/2 2.0 with CM/2 1.0	LAN (token-ring and Ethernet) and Coaxial	X	X	X
OS/2 2.0 with Extended Services	LAN (token-ring and Ethernet) and Coaxial	X	X	X
DOS APPC/PC	Token-Ring	X	-	-
DOS APPC/PC with 3174 Peer Communications (LAN over coax) device drivers	Coaxial	X	-	-
PC Support/400	LAN (token-ring and Ethernet) and Coaxial	X	-	-
Client Access/400	LAN (token-ring and Ethernet) and Coaxial	X	-	-
Networking Services/DOS 1.0	LAN (token-ring and Ethernet) and Coaxial	X	-	-
Networking Services/Windows	LAN (token-ring and Ethernet) and Coaxial	X	-	-
AIX SNA Services V1R2	Token-Ring	X	-	-
AIX SNA Services V2R1	LAN (token-ring and Ethernet)	X	X	X
RXR/2	Token-Ring and Frame Relay	X	X	X
6611 MPTN	Token-Ring and Frame Relay	-	-	X
3172 ICP V2 with VTAM V3.4	Token-Ring	X	-	-
3725 with NCP V4.3.1	SDLC and Token-Ring	X	-	-
3720 with NCP V5.2.1 thru V5.4	SDLC and Token-Ring	X	-	-
3745 with NCP V5.2.1 thru V6.1	SDLC and Token-Ring	X	-	-
3745 with NCP V6.2 (VTAM V4.1)	SDLC, X.25 and Token-Ring	X	X	X
3745 with NPSI V3.5	X.25	-	-	X
3745 with NCP V7.1	Frame Relay and previous links	-	-	X
ES/9370 with VTAM V3.3	SDLC and Token-Ring	X	-	-
4361 with VTAM V3.3	SDLC	X	-	-
VM with VTAM V3.3	Parallel Channel	X	-	-
MVS/ESA with VTAM V3.4	Parallel Channel	X	-	-
MVS/ESA with VTAM V4.1	Parallel Channel / ESCON	X	X	X
Note: X = Supported				

1.3 3174 APPN Network Node Feature

With 3174 Configuration Support-C, the 3174 can serve as a network node for other LEN, EN, and NNs communicating (including subarea VTAM and APPN VTAM communication) over the supported links. See 1.2, “3174 APPN LIC Feature Connectivity” on page 8. Using Peer Communications (LAN over coax), intelligent workstations can attach to the 3174 Terminal Adapter (HG 26 and HG 27) ports as LENs, ENs, or NNs. In addition, the 3174 as a network node provides network node services to LEN ENs and APPN ENs.

As an APPN network node, the 3174 provides the following functions to assist in building and managing an APPN network:

- Control Point Services
- Intermediate Session Routing
- LU 6.2 Services

The 3174 NN calculates the best route to a destination for its served resources using its knowledge of the network’s topology and the desired COS. When a link fails and another path is available, the 3174 NN can re-establish a session using dynamic routing. Because routes are not predefined and ENs can register their resources with the 3174 NN, network system definition is minimal. Nodes can be added or deleted without re-customizing the 3174.

1.3.1 Control Point

At the center of all APPN network level communications is the control point. A control point can exist in a network node or end node (LEN nodes have a control point, but the capabilities are limited). It is where management of the network resources begins and ends. In the 3174 APPN network node, the control point communicates with the end nodes that it serves and other NNs to provide:

- CP Capabilities Exchange
- Session Services
- Configuration Services
- Address Space Manager
- Topology and Routing Services
- Directory Services
- Management Services

Before many of these services can take place, a control point-to-control point session must exist between the 3174 and an APPN node in the network. The 3174 assumes the capability to establish a CP-CP session with all adjacent nodes. It is up to the adjacent node to request a CP-CP session. There is not an option available in the 3174 customization to indicate the support of a CP-CP session with another node. Once a link is established, the existence of a CP-CP session can be displayed using the 3174 Online Test 17 option 2.

1.3.1.1 CP Capabilities Exchange

CP capabilities exchange is the process that takes place whenever two nodes wish to establish a CP-CP session.

This exchange establishes the extent of network services that each node supports, and provides the basis for future CP-CP communications between the nodes.

1.3.1.2 Session Services

The primary function of Session Services is to assist in the initialization and termination of CP-CP and LU-LU sessions.

1.3.1.3 Configuration Services

This service is responsible for establishing, managing, maintaining, and terminating the local links that are connected to this node.

1.3.1.4 Address Space Manager

As the name implies, this service manages all of the address space tables being used by the 3174 APPN network node. There is a one-to-one correspondence of links to address spaces.

1.3.1.5 Topology and Routing Services

The 3174 APPN network node collects and exchanges information on links and network topology with other network via topology database updates. This information is maintained in a topology database in control storage.

The 3174 APPN network node also selects the best route for session end points based on the Class of Service (COS) desired.

To select the best route to a destination, the 3174 APPN network node maintains a COS database which contains a table specifying the transmission group characteristics and node characteristics for each COS name.

1.3.1.6 Directory Services

The 3174 network node maintains a directory of network resources and their location, including the names of the LUs in the LEN nodes and end nodes that it serves.

For a LEN node to be served by a 3174 network node, its LU must be entered into the directory database either through customization or as a result of a previous sending of a BIND, if it is to be a BIND receiver. A LEN node that is a BIND sender does not need a prior entry in the database.

An end node, however, can register its LUs in the 3174 network node server directory database when required.

The directory database contains information from customization as well as information learned during network operation. The information that is learned is cached in control storage.

If a hard disk is available, the cached information is copied from control storage to the hard disk periodically. The frequency of this checkpointing is based upon network activity and cannot be controlled by the user. When a re-IML is required, the directory database containing the customized and cached information is reloaded into control storage.

In addition to performing directory services for the LEN nodes and end nodes that it serves, the 3174 network node also performs directory services in response to search requests by other network nodes in the network.

Note:

Central Directory Client: The 3174 can, with Configuration Support-C5, take advantage of an APPN Central Directory. This function lessens the number of broadcast searches sent by 3174 since the Central Directory is automatically updated by other network nodes as they join the network. See 1.10, "Central Directory Client" on page 46 for more information.

1.3.1.7 Management Services

The 3174 NN provides support for the Management Services (MS) application layer and the MS transport layer for handling MS data. MS applications may reside in Entry Point and Focal Point nodes. An Entry Point sends MS data about itself and the resources in its domain to a Focal Point for centralized processing. A Focal Point is a centralized distributor of MS requests and collector of MS data. Prior to Configuration Support-C5, the 3174, in an APPN environment, acted as a pseudo-Focal Point to the ENs that it served. As a pseudo-Focal Point, the EN built an alert and sent it to the 3174 NN over the CP-CP session. Acting as a network node in the APPN network, the 3174 uses its Management Services (MS) functions to parse the alert and convert to an NMVT (Network Management Vector Transport). The NMVT is then forwarded on to NetView.

In Configuration Support-C Release 3 and 4, the 3174 NN must still be boundary-attached to a host, and is only able to send alerts to an SSCP. The need to be able to send alerts to an APPN Focal Point, using the architected Management Services Transport mechanism (utilizing LU 6.2), is addressed in Configuration Support-C5. Refer to 1.11, "Network Management" on page 46 for more information on the Management Services LU 6.2 support for the 3174.

1.3.2 Intermediate Session Routing

As a network node, the 3174 participates in setting up sessions when it is an intermediate node for those sessions and is involved in certain session protocols, such as session pacing, after the session is set up. As an intermediate node, it accepts traffic from one session node (stage) and passes it to the next node along the session path. Since each session stage may vary in RU sizes, flow control, and required outage notification, the 3174 as an intermediate node is responsible for such functions as segmenting and supporting adaptive session pacing. This is called intermediate BIND processing.

1.3.3 LU 6.2 Services

The 3174 APPN network node contains a single independent LU 6.2 with parallel session capability. This LU supports the T2.1 control point and can also serve as the LU for Central Site Change Management. For this to happen, the LUNAME must be the same as the CPNAME. Since the 3174 has no end user programming interface, the only LU 6.2 application externally available is CSCM.

1.4 3174 Network Node Services

As a part of being an APPN network node, the 3174 provides services to adjacent end nodes and LENs that enable them to participate in an APPN networking environment.

The following 3174 network node services are enhanced or added for Configuration Support-C Release 3 and later:

- Link activation
- Network node server
- LEN/Subarea routing
- Dynamic shared link
- Multiple link support
- Surrogate resource support
- Dependent LU requester (DLUR)
- Central Directory requester

An overview of these services is provided in the subsequent sections of this sub-chapter. For detailed information on network node services, see the *3174 Functional Description*, GA23-0218.

1.4.1 Link Activation

The activation of APPN networks is dynamic in nature. APPN nodes become active network components by the decisions of their local operator to join the network.

Control points (CPs) activate, control, and deactivate links through the link stations (data link control elements) in the node. Activating a link, configuration services in the CP cause data link control to issue link-level commands to the link station for that link. Once a link between adjacent nodes is activated, and a bind has been received and accepted, that link can carry session traffic.

Link activation is made up of three phases:

- Connect
- Pre-negotiation
- Contact

The *connect phase* establishes the initial logical connection between adjacent nodes. The TEST command is issued by the 3174 if the CPNAME, DLC type (LAN or frame relay) and/or address is included in the Network Resources panel during 3174 customization. Otherwise it is up to the adjacent node to initiate communications.

The *pre-negotiation phase* is an optional phase; thus, it may or may not take place based upon the link activation implementation of the node in which the 3174 network node is attempting communications. The 3174 network commences the pre-negotiation phase by sending a null XID as a poll to initiate an XID response from the adjacent node. If the adjacent node responds with an XID type 3 (XID 3) with the exchange state indicators (byte 9 bits 4-5) field set to *pre-negotiation* (B'xxxx10xx'), the 3174 network knows that the node is a T2.1 and continues the pre-negotiation XID exchange process. The optional pre-negotiation phase is concluded or omitted when the exchange state indicator (byte 9 bits 4-5) field of the XID type 3 (XID 3) indicates *negotiation proceeding* (B'xxxx11xx').

If there is a pre-negotiation phase, the node identity (CPNAME) is validated during the process. Otherwise, the node identity is verified during the contact phase. The contact phase is the final phase of link activation and is where the adjacent nodes convey the link station roles, link characteristics and certain node capabilities. Once it is established which node is the primary link station, the contact phase is completed by the primary link station sending a Set Mode command (for example, SNRM, SABME, etc.), and the secondary link station responding with an unnumbered acknowledgement.

Prior to 3174 Establishment Controller Configuration Support-C Release 3, once the link was activated, the node identities (CPNAMEs), link station roles, link characteristics and capabilities, could only be changed by deactivating and reactivating the link.

In order for the 3174 network node to operate in the new APPN/Subarea world of VTAM Version 4 Release 1, changes were made to allow for the possible CPNAME, TG number, and CP capabilities change of SSCP takeover. The non-activation XID 3 is used to convey changes without disturbing the existing active link.

Sometimes an SSCP takeover can happen prior to link activation, so the 3174 must be able to accept a node identity (CPNAME) that is different from the CP name coded on the Network Resources panel. Configuration Support-C Release 3 and later has the ability to accept the new CP name indicated in the XID 3 when the link is being initiated by the adjacent node.

For more details on the SSCP takeover process, refer to 1.6, "3174 and VTAM SSCP Takeover" on page 38.

1.4.2 Network Node Server

A network node that provides APPN network services for an EN or LEN end node is a network node server for that node. The 3174 regards all ENs as authorized. A network node server for a node performs routing and directory services for that node.

End Node Support: An end node is capable of CP-CP sessions with a 3174 network node (or other adjacent network nodes). A 3174 network node can be a server for an end node.

The services performed by a 3174 network node for an end node that it serves are:

- T2.1 link connection

A 3174 network node server can initiate a T2.1 link connection to an end node when it is IMLed if it knows the control point name, the node type, DLC type and address of the end node through customization in the Network Resources panel.

Once this connection is established, the end node can use the link to transport multiple, parallel LU 6.2 session traffic for independent LUs.

- CP-CP sessions

A 3174 network node server will respond to a request for CP-CP session activation from an end node. When the CP-CP session is established between the end node and the 3174 network node, the end node can make its capabilities known to the 3174 network node server.

- Resource registration

A 3174 network node server allows an end node to register its resources in the server's directory database. Registration enables the 3174 network node server to respond to search requests for the end node's resources from other nodes.

- Directory services and preferred route selection

A 3174 network node server performs directory searches to locate a remote LU name requested by an end node. The end node does not have to configure any remote LUs with which it may require a session.

- Network management

A 3174 network node server can act as a *focal point* (referred to as a *pseudo focal point* in Table 1 on page 6) or forward alerts sent by an end node to a real focal point. The 3174 network node as a pseudo focal point converts the alerts to NMVTs and sends them to NetView via an SSCP-PU session. The 3174, when not acting as the pseudo focal point, does no conversion of the alert received from an entry point prior to forwarding it to the focal point via an LU 6.2 session. For more information on network management see 1.11, "Network Management" on page 46.

At any one time, an end node must have only one network node server in an APPN network. If a 3174 network node is to be the server, the link type specific address of the 3174 network node needs to be defined in the end node.

LEN Node Support: A LEN node has more limited capabilities than an end node. The services performed by a 3174 network node for a LEN node that it serves are:

- T2.1 link connection

A 3174 network node server can initiate a T2.1 link connection to a LEN node when it is IMLed if it knows the control point name, the node type, DLC type and address of the LEN node through customization in the Network Resources panel.

Once this connection is established, the LEN node can use the link to transport multiple, parallel LU 6.2 session traffic for independent LUs.

- A LEN node is not able to support CP-CP sessions and, therefore, cannot transfer certain APPN information to the 3174 network node server. For example, the LEN node cannot send its local LU names to the 3174 network node server. The 3174 network node server cannot automatically register LU names of the LEN node.

The 3174 network node server, however, can be customized with the LU names of the LEN node so that it can respond to search requests for those LUs.

The 3174 network node server also caches results of directory services. When a LEN node sends a BIND to the 3174 network node server, the 3174 caches the local LU name specified in the BIND as an entry in the directory database. Using this cached entry, the 3174 network node server can respond to subsequent search requests for that LU.

- When a LEN node wishes to communicate with another LU, it cannot send or receive a search request to locate the desired LU. Instead, the LEN node must send a BIND specifying the partner LU name to the 3174 network node server.

When the 3174 network node server receives the BIND, it performs directory services to locate the desired LU. When it has located the desired LU, it selects the preferred route, attaches the route selection control vector (RSCV) and forwards the BIND through the network to the desired LU without further involvement from the LEN node.

- There is no network management support provided by the 3174 network node server for LEN nodes, except via the gateway function.

A LEN node, like an end node, must have one and only one network node server in an APPN network. If a 3174 network node is to be the server, the link type specific address of the 3174 network node needs to be defined in the LEN node. In addition, the address of the 3174 network node server is the destination for all partner LUs as all BINDs are sent to the 3174 network node server.

1.4.3 LEN/Subarea Routing

Prior to VTAM Version 4 Release 1, the host subarea did not support CP-CP sessions on its T2.1 link connections and, therefore, could not register LUNAMES or process LOCATE search requests. This meant that access to all LUs that resided in the subarea or beyond had to be predefined (specific or wildcard) at the boundary-attached 3174 NN.

VTAM Version 4 Release 1 provides APPN routing; thus, predefinition of LUs or wildcard routes at the 3174 is only required when VTAM has been defined as a pure subarea. Definition of LUs is not required for APPN VTAM (interchange node, migration data host, ENs and NNs).

Defining access into a subarea can be done by defining:

- A wildcard route
- Specific LUNAMES
- A group of related LUNAMES using generic naming

Each type of definition can be used alone or in combination; however, there can be only one full wildcard route into a subarea from an APPN network.

1.4.3.1 Wildcard Routing

Explicit definition of the LUs that reside in a subarea can be an extensive task. Defining a Wildcard route is one way to minimize that definition. To define Wildcard routing at the 3174 NN, it must be T2.1 boundary attached within the APPN network to the subarea. When a T2.1 boundary-attached 3174 NN is defined with a Wildcard route, it can service those resources in the subarea although they are not known explicitly in the APPN network. Full Wildcard routing is designated by responding with a **1** to Question 612 during 3174 APPN customization.

When the 3174 NN server cannot locate a fully specified resource name and Wildcard is enabled, the 3174 NN server responds to the locate with a non-explicit (Wildcard) response indicating that the host CP owns the resource.

An explicitly defined resource or a resource that was defined using generic naming returns explicit responses. When Wildcard definition is used in combination with the specific definition of LUNAMES or generic naming, an explicit response is always selected over a Wildcard response.

When a Wildcard route is used, the NN server cannot verify that the LU is found; however, if the LU is located in the subarea or defined to the subarea (for example, in another APPN network attached to the subarea), the subarea routes the Bind request. If the LU is not found, the Bind fails.

When planning for Wildcard routing, consider the following:

- Only one node in a connected APPN network may have the Wildcard option.
- An explicit response is always chosen over a Wildcard response.
- Because the NN server cannot verify the LU location, caching is not done. Therefore, a broadcast search is always initiated for this resource.
- If the route is calculated to the NN with the Wildcard option for a resource, all traffic for this resource is routed through the NN providing the Wildcard response.
- The AS/400 refers to the Wildcard option as *ANY Routing. If an AS/400 is in the connected APPN network with the *ANY option, there cannot be a 3174 in the network with the Wildcard option (response to Question 612=1).
- In a single link multiple host (SLMH) environment, any of the host links (1A through 1H) can be defined as the wildcard route.

A typical use of wildcard routing is shown in Figure 1 on page 19 where a 3174 network node/LAN gateway, with its wildcard option enabled, is attached to a subarea network.

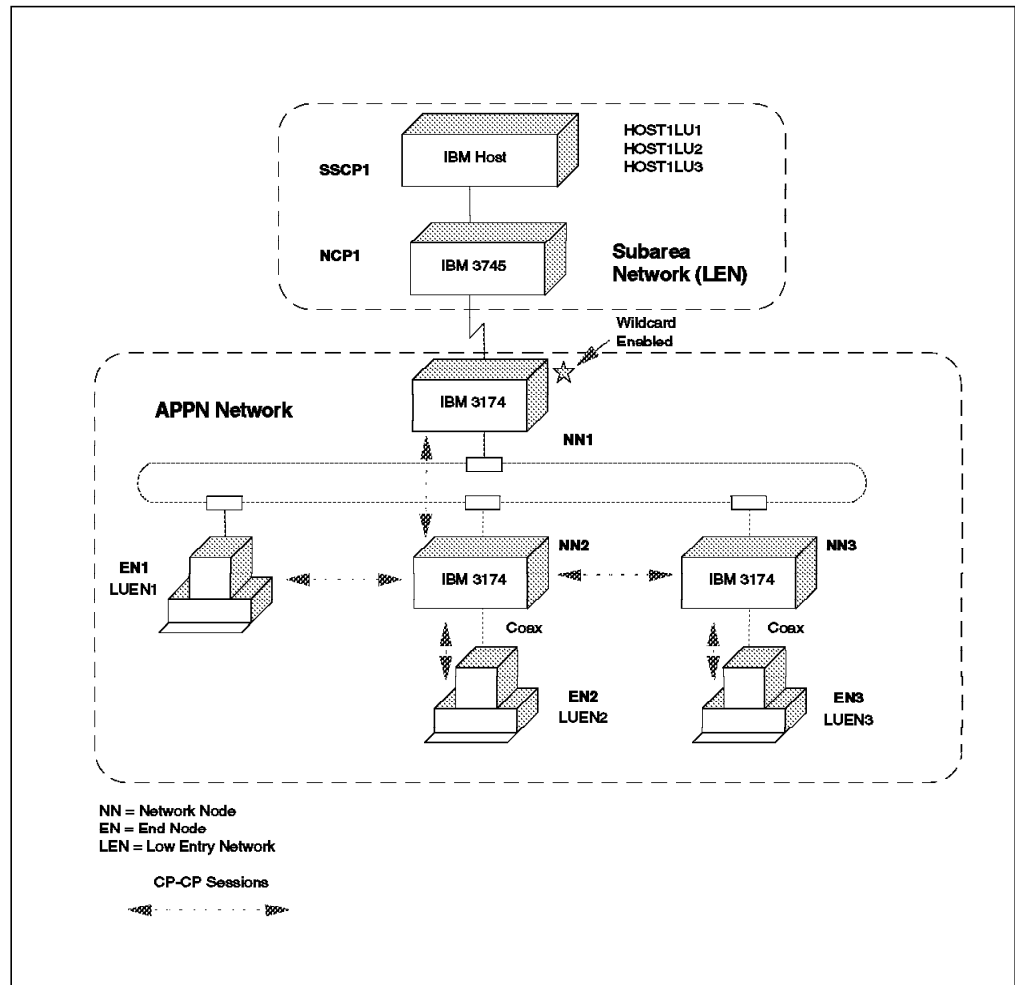


Figure 1. Example of a Wildcard Routing to a Subarea Network

If the subarea is running VTAM V3.4 or later with DYNLU=YES, the initiating LUs can be dynamically defined. If not, they have to be predefined to VTAM. Destination LUs have to be predefined to VTAM unless a Session Management Exit (SME) is programmed. Using one possible scenario of the configuration shown in Figure 1, for an independent initiating LU to access LUs in the subarea network, the following occurs:

1. EN1 sends LOCATE/FIND host LU to NN2 server.
2. NN2 server does a broadcast search.
3. NN2 server receives a wildcard response from NN1.
4. NN2 server calculates a route from EN1 to NN1 to the host.
5. NN2 server sends the calculated route to EN1.
6. EN1 sends a BIND to NN1, which then forwards the BIND to the host.

Note: NN2, although boundary-attached (GW and DSPU are seen as a drop of a multi-drop line), also cannot respond because its wildcard option is not enabled. In addition, all APPN-subarea network traffic passes through NN1. In this example, EN1 traffic is routed through NN2 to NN1 to the host.

1.4.3.2 Wildcard in a Single Link Multiple Host (SLMH) Environment

In the releases prior to Configuration Support-C3, there could only be one T2.1 hybrid link (shared T2.1 and T2.0) in the subarea. Only the link to the first host on the primary link (host 1A) could be defined to be hybrid T2.1/T2.0; all other host links had to be pure T2.0. Prior to VTAM Version 4 Release 1, this link was limited to a LEN connection and only this link could be defined as the wildcard entry. With the advent of Configuration Support-C3, any and all of the host links can be defined as a hybrid T2.1/T2.0 link. Since any of the links can be hybrid T2.1/T2.0, it makes sense that any of the host links could be the wildcard entry into the subarea. Since Configuration Support-C3, any of the host links can be defined to be the wildcard entry.

SLMH support is available for:

- X.25
- LAN (token-ring or Ethernet)
- Frame relay
- ESCON

When in an APPN or LEN environment:

<i>Table 3. 3174 SLMH Support in an APPN Environment</i>	
Link Type	Minimum Configuration Support-C Release Level
LAN (token-ring)	C Release 3
LAN (Ethernet)	C Release 4
X.25	C Release 5
Frame Relay	C Release 5
ESCON	C Release 6

In Figure 2 on page 21, we have a case where the 3174 NN2 is a DSPU accessing multiple host through multiple gateways on the token-ring. We have two host links defined on the primary token-ring adapter in NN2. The first link (1A) does not have wildcard enabled. The second link (1B) has been customized as the wildcard link on the APPN Node Definition panel (Q613=1B).

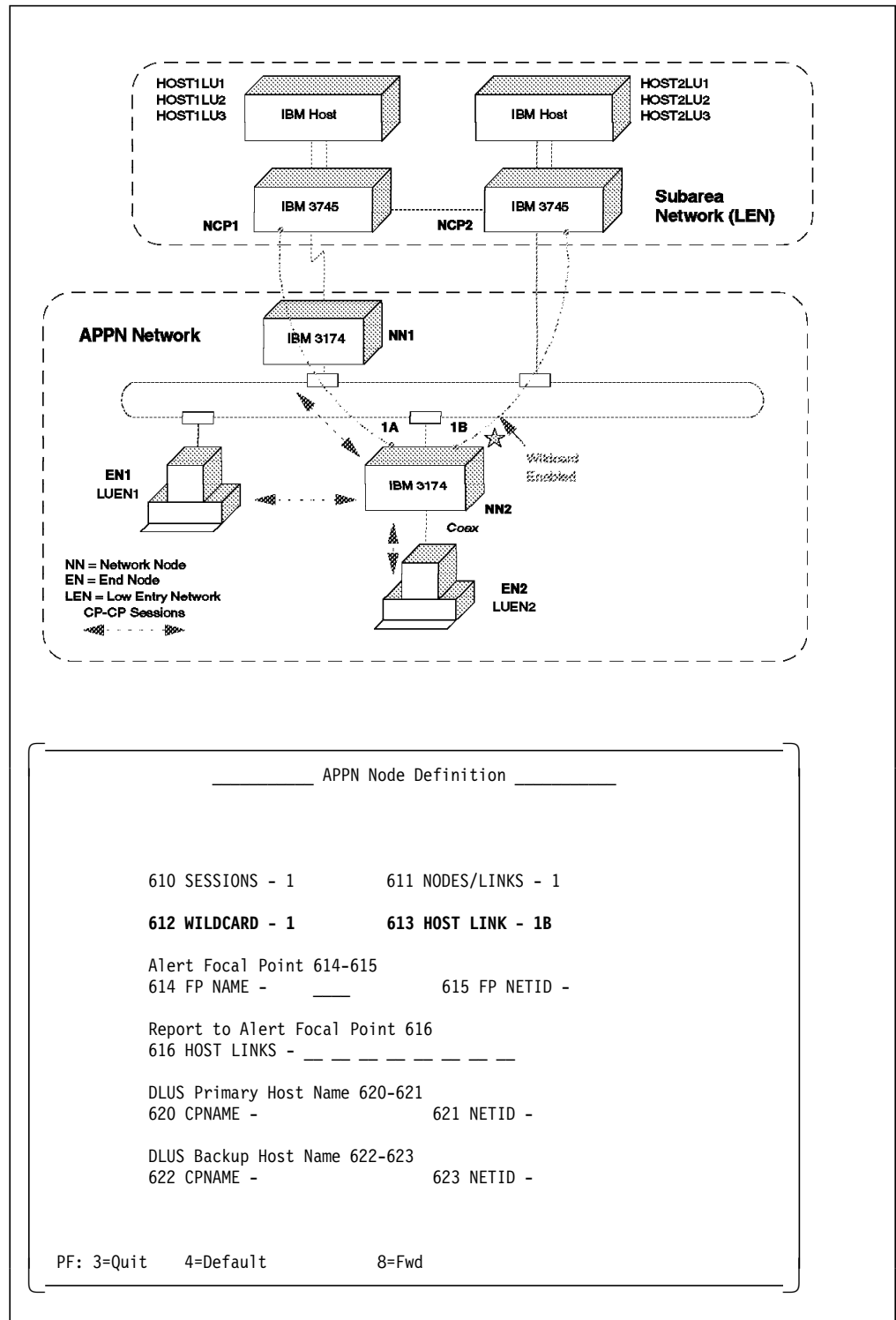


Figure 2. Wildcard Enabled in a Single Link Multiple Host Environment

1.4.3.3 Specific Definition of LUNAMES

Subarea LUs can be specifically defined at a boundary-attached 3174 NN. This provides an explicit route to the subarea from an APPN network for those LUs. Specifically defining subarea LUs adds these resources to the 3174 NN's directory. When an NN server sends a LOCATE request for an LU defined at the 3174 NN, the 3174 NN responds with an explicit response. However, a route that is defined using generic naming also returns an explicit response. If LUs using specific naming are used in combination with LUs using generic naming, multiple responses may occur. In this case, the NN server uses the first explicit response it receives to calculate the route, unless the first explicit response is a surrogate and a subsequent non-surrogate response is received. In this case, a non-surrogate (true owner) explicit response has precedence over a surrogate explicit response.

LEN host LUs can be defined such that the optimal or preferred path from the APPN network to the LEN subarea is specified. If you determine that a particular 3174 in the APPN network provides the best path to a host LU in the LEN subarea, explicitly customize the LEN host LU to that 3174 by coding the full name of the LU on the Associated LU panel during 3174 APPN customization.

Figure 3 on page 23 illustrates multiple links from an APPN network to a LEN subarea. LUA is defined at the 3174, BANN1, because the link from BANN1 to the subarea (TG 1) provides the most direct route to LUA (the Associated LU panel). Figure 3 on page 23 illustrates the specific LU definition for the BANN1 LEN connection to subarea SSCP1. In the same manner, LUB is defined at BANN2 because the link from BANN2 to LUB (TG 2) is the best alternative. BANN 3 has the wildcard option specified, indicating that it can provide the route for any LU that does not have an explicit route. When the EN requests a LOCATE for LUA, BANN1 will explicitly reply with a *surrogate resource* indicator bit set to on, which specifies that it does not actually own LUA, but does have a route to it. The wildcard will also respond, but with a wildcard route. An explicit route, with or without the *surrogate resource* indicator set, will always be chosen over the wildcard route. Since LUC is not explicitly defined at any BANN node in the APPN network, the wildcard node provides the only path from the EN to LUC via TG 3.

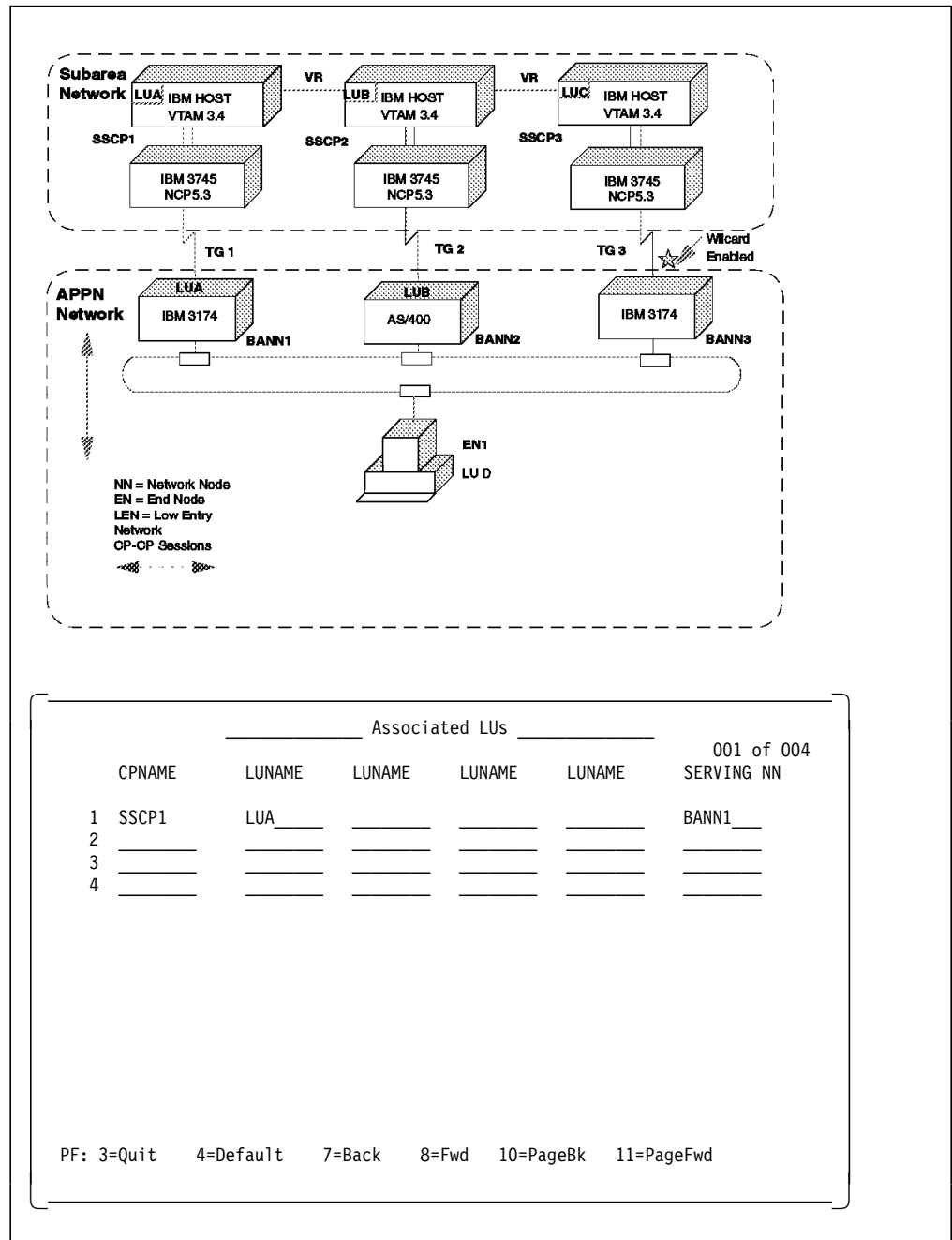


Figure 3. Specific LU Definition with a Wildcard Path Defined

VTAM Version 4 Release 1 provides what is known as the VTAM Interchange node. The VTAM Interchange node is an APPN network node that contains both an SSCP and a CP. The Interchange node is simultaneously located in the APPN network and the subarea. The Interchange node in an APPN network differs from a *boundary-attached network node* (BANN) node in that the Interchange node does have an SSCP. It does not need to define LEN Host LUs to enable the sending of data to the LU because it can communicate with the SSCP in the LEN subarea to determine where an LU is located. Figure 4 on page 24 illustrates an APPN network that contains an Interchange node.

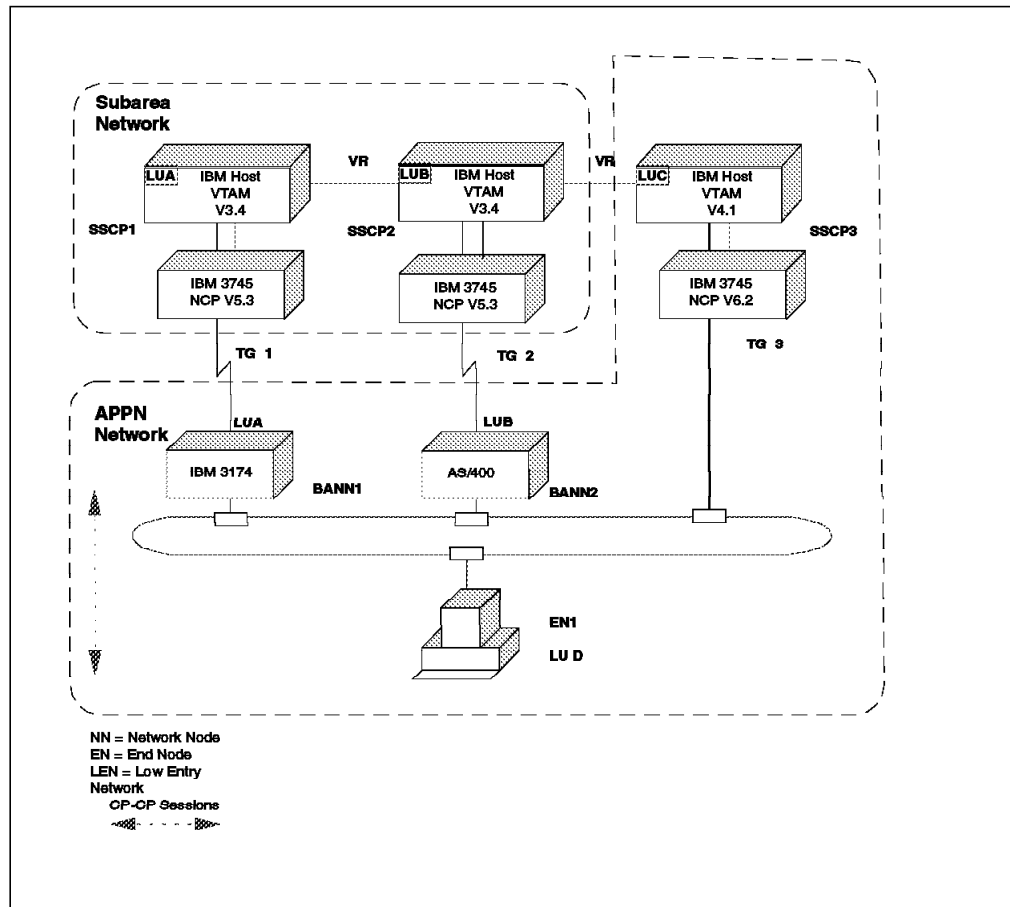


Figure 4. Specific LU Definition with an Interchange Node

Figure 4 is the same as Figure 3 on page 23, except that the Interchange node is replaced with the wildcard enabled boundary-attached network node (BANN3). When the EN requests a LOCATE for LUA, BANN1 will reply with a LOCATE/FOUND since LUA has been specifically defined to it. The Interchange node in the diagram will also reply explicitly since it also knows where LUA is located. Both BANN1 and the Interchange node will reply with a *surrogate resource* indicator bit set to on, since neither of them actually owns LUA. Whether the Interchange node route or the BANN1 route is chosen depends on the serving network node's capabilities. If the serving network node is the Interchange node, it will choose the best route in the APPN network based on its knowledge of the subarea network. If the serving network node is the 3174, it will choose the route of the first response that was received.

Since LUC is not explicitly defined at any BANN node in the APPN network, the Interchange node will provide the path from the EN to LUC. When an Interchange node is in the configuration, there is no need for a wildcard definition in the APPN network to the same LEN subarea, since the wildcard route will never be used. This is because the Interchange node will always respond explicitly to a LOCATE request, since it knows where all the LEN subarea host LUs are located, and the wildcard node will respond with a non-explicit response (wildcard route). Remember that a wildcard route will never be chosen over an explicit route.

Customizing the LEN host LUs at the 3174 boundary-attached network node (BANN) allows the network node to add these resources to its directory. Thus, when an EN or NN does a locate search for a host LU resource that is configured at the 3174 BANN, the BANN can respond with an explicit reply allowing the serving NN to cache the location of the host LU. This reduces the number of broadcast searches that are needed to locate LEN host LUs, but can also cause the node performing a search to get multiple responses. In previous 3174 APPN releases this was considered an error because we should never have received multiple responses. Configuration Support-C Release 3 and later has added the necessary processing so that the first explicit response with the *surrogate resource* bit set is cached as the preferred route. See 1.4.5, “Surrogate Resource Support” on page 29 for additional details of this processing.

1.4.3.4 Generic Naming

A logical group of LUs can be partially defined using generic naming. This allows all traffic to that group of LUs to be sent over a specific link. You can define a group of LUs that have LUNAMES that begin with the same characters. An asterisk (*) is used in the definition to provide a generic match to the rest of the LUNAME. For example, a group of TSO LUs can be defined so that all TSO traffic flows over one particular link. In this case, TSO* would be the generic name.

Notes:

1. To use generic naming effectively, there must be a consistent naming convention for all involved networks.
2. Because a route defined with generic naming returns an explicit response, it works similarly to an explicit response and is always selected over a wildcard response.

Generic LU name specification involves customizing a set of LUs to send data over a particular link by entering a part of the LU name followed by an asterisk. For this to work properly, the LEN host LUs need to be named carefully. For example, if you want all traffic to TSO LUs to flow over a particular link, the LUs need to be named appropriately (for example, TSO1, TSO2, etc.). If there is an Interchange node in the network configuration, all TSO traffic still may not flow over the defined link, since there is no mechanism to differentiate between the explicit response sent by the node that had the partial LU definition and the Interchange node. Thus, it is not always true that Multitail allows the customer to control which link it wants a particular set of LU traffic to flow over. In the following configurations it is unpredictable as to which link is used to send subarea LU traffic:

- Interchange node in the network configuration
- Subarea LU defined at multiple BANNs

Since there is nothing currently in the 3174 implementation or the APPN architecture that distinguishes an explicit response coming from a BANN that has specifically or generically defined the LUs versus a response coming from an Interchange node, you are unable to define specific LUs per link.

Figure 5 illustrates a partial wildcard definition. BANN1 is defined to send all TSO traffic over TG 1. Thus, if LUD in the EN wants to send data to either TSO1 or TSO2, it goes through BANN1 over TG 1, or potentially it could go through the Interchange node over TG 3 since they will both explicitly respond to the LOCATE request. BANN2 is defined to send all CICS traffic over TG 2. Thus, any data that needs to be sent to CICS1 will either go through BANN2 over TG 2 or through the Interchange node over TG 3. The Associated LU panel shown in Figure 5 illustrates generic naming at BANN1 of the TSO host LUs.

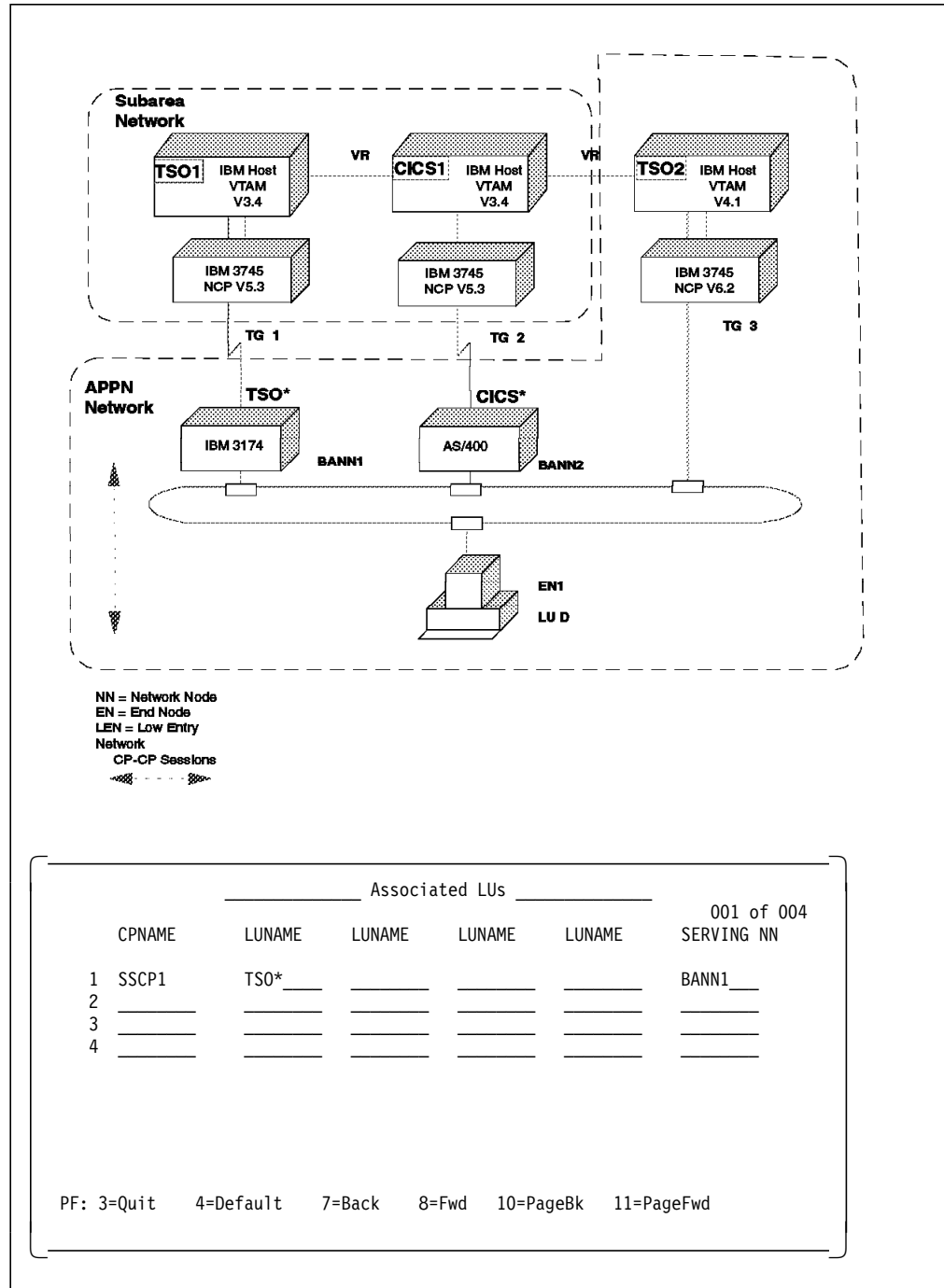


Figure 5. Partial Wildcard Definition

Other than the way an LU is defined, the partial wildcard definition acts the same as a specific LU definition.

Note: Although the generic naming was implemented specifically to reduce the burden of defining LUs for LEN-SSCPs, it may be used for defining LUs for any other APPN or LEN node.

1.4.4 Multiple Link Support (Multitail)

Multiple Link Support, or Multitail, allows multiple, simultaneous connections between an APPN network (or node) and a subarea. Simultaneous connectivity for Multitail is provided by multiple LEN T2.1 Transmissions Groups (TGs).

Prior to 3174 Establishment Controller Configuration Support-C Release 3, the only T2.1 link into the subarea was a wildcard link. The wildcard link can be one of the LEN T2.1 links in a Multitail environment. However, the wildcard option alone will not allow multiple links into the subarea network since there can only be one wildcard link in a connected APPN network.

To implement Multitail support, the LEN/Subarea Routing techniques discussed in 1.4.3, "LEN/Subarea Routing" on page 17 are employed in combination with being able to define the LEN host node type (LEN-SSCP) during 3174 APPN customization. LEN hosts are defined as a new Node Type of 4 (LEN-SSCP) on the Network Resources panel. The LU definition can be explicit (specific LU naming), partial (generic naming using part of the resource name and using an asterisk to indicate the remainder can be anything), or wildcard (matches any target resource).

In summary, to implement Multitail support, Configuration Support-C Release 3 and later provide the following capabilities:

1. Enable explicit customizing of the LEN subarea host LUs.
2. Enable partial wildcard specification (generic naming) to allow all traffic to a particular set of LUs to be sent over a particular link to the LEN host.
3. Multitail support in an SLMH environment. This enhances the wildcard specification implemented in earlier versions to enable defining wildcard on any LEN host link.
4. Allow a CP name change before Link Establishment.

Since we have discussed items 1, 2, and 3 in general under 1.4.3, "LEN/Subarea Routing" on page 17, we now discuss implementations as they relate to Multitail.

1.4.4.1 Multitail in a Single Link Multiple Host (SLMH) Environment

Multitail can exist in an SLMH environment when the host attachment is via a LAN (token-ring or Ethernet), frame relay or X.25. There can be up to eight host attachments in this environment. LEN host LUs can be defined for each LEN host connection in the LEN subarea. Figure 6 on page 28 depicts Multitail support in an SLMH environment using LAN connections.

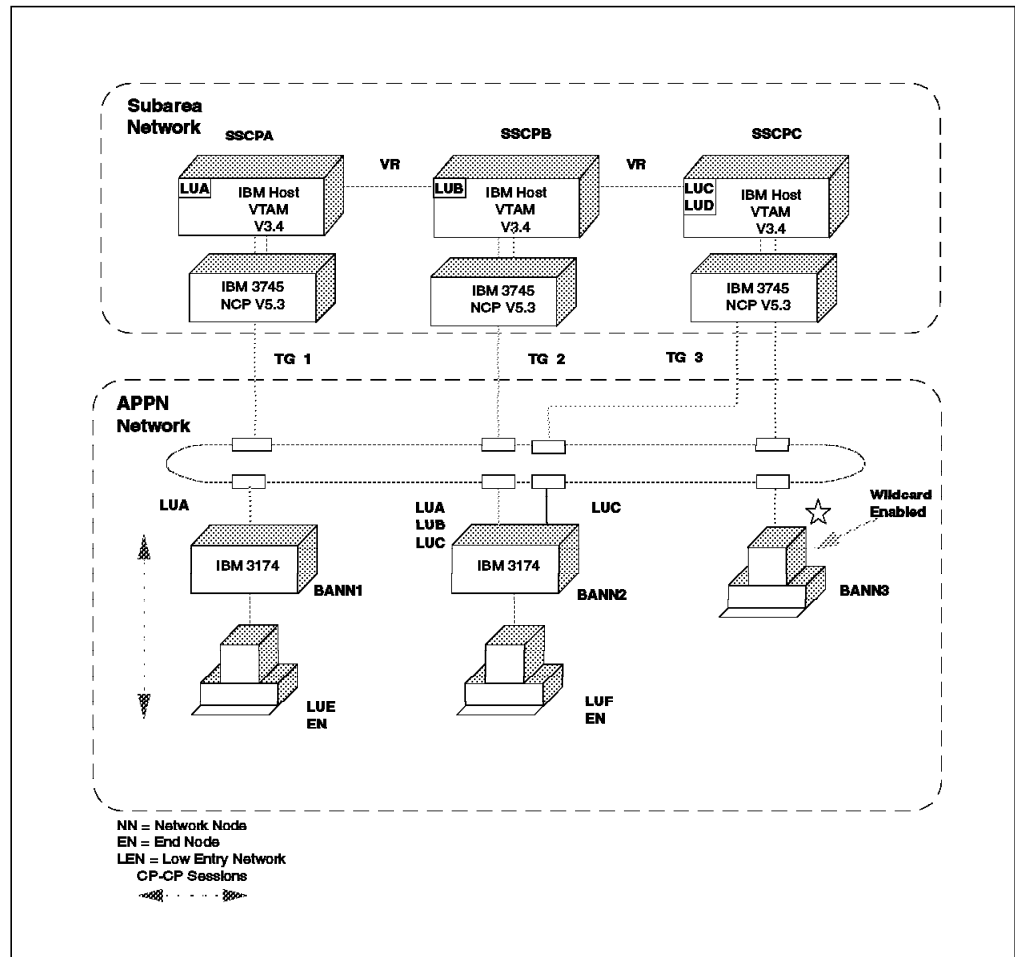


Figure 7. Backup Links Using Multitail

1.4.4.3 Load Balancing Using Multitail

Multitail support provides the ability for you to load balance session traffic between an APPN network and the subarea. This does not imply that with Multitail there will be an equal amount of traffic on every subarea link. It just means that you are no longer limited to just one T2.1 link to LEN subarea LUs from an APPN network, and you have the capability to define the link that is used to send data to a particular LEN subarea LU. The links can be defined to have whatever LU traffic that they want to flow on a particular link, from just a single LU, to every LU that is defined to be, for example, a TSO LU. This gives the user the ability to balance the load on a particular link, which is an alternative to having the 3174 dynamically balance the load.

1.4.5 Surrogate Resource Support

We have talked extensively about the *surrogate resource indicator* in 1.4.3.3, "Specific Definition of LUNAMES" on page 22. In this section, we focus on how the 3174 uses this indicator when:

- Answering locate requests for LUs that have been defined either specifically or generically on the Associated LU panel of the 3174 APPN customization
- Receiving replies from broadcast search requests

When the 3174 NN is attached to a LEN/SSCP and LUs have been defined in the 3174 for this CP, the 3174 responds to all Locates (Finds) for those LUs with an explicit Locate (Found). This reply also indicates that the LU is known by the 3174 but that the 3174 is not the owner. This is indicated by setting the surrogate resource indicator in the Locate (Found). The surrogate resource indicator is how the 3174 NN tells a node in the network that it does not own an LU, but does know where it exists.

When the 3174 NN receives a BIND request from a LEN/SSCP and needs to send a Locate (Find) for the target, the search request indicates that the 3174 does not own the origin LU but does have a link to it if the surrogate resource indicator is set in the Locate (Find). Receivers of this Locate (Find) cache this information and replace it when they learn of the actual owning CP.

When the 3174 NN issues a broadcast search request, it is possible to receive more than one explicit reply. When the first explicit positive reply is received, it is cached into the DS database. If the first reply is a surrogate resource reply, it is cached and any other surrogate resource reply is ignored. When an explicit reply is received that is not a surrogate resource reply, this reply replaces the surrogate resource response. When the 3174 NN is propagating a received search, the first explicit response received is the one used to answer the search request, even if it is a surrogate reply. Replacing the surrogate reply with an actual reply ensures that any future searches receive the actual reply.

The 3174 NN generates an alert if a broadcast search results in multiple positive explicit replies by indicating that the same target LU is owned by more than one CP. The owner of the target LU is returned in the Locate (Found). Surrogate resource replies are not checked for this alert.

1.5 Link Types

The type of link to be established between the 3174 NN and an adjacent node can be defined at either node or both. If the link type is defined at both the 3174 NN and the adjacent node, the definition must agree in CP Name, Node Type and DLC type. The only exception is when there is SSCP-Takeover involved, prior to link activation. For this reason, it is usually best to define the link in one or the other, but not both nodes.

From a 3174 NN perspective, the definition can be one of the following:

- Explicit Links
- Dynamic Homogenous Links
- Dynamic Shared Link

Regardless of the nature of the link definition (that is, explicit or dynamic), the 3174 uses the XID exchange during link activation to determine the nature of the other node and the type of link to be established.

With Configuration Support-C 3 and later, the 3174 can support three types of SNA links:

- A link that carries only T2.0 traffic
- A link that carries only T2.1 traffic
- A link that carries both T2.0 and T2.1 link (shared link)

XIDs indicate this as follows:

null XID	This XID does not connote any particular type of link. It is only used at the start of a pre-negotiation XID exchange.
XID 0 or 1	These XIDs are sent by nodes desiring a T2.0 link.
XID 3	This XID is sent only by APPN and LEN nodes, and indicates that a T2.1 link is desired. The XID contains an ACTPU Suppression flag, which indicates whether or not an SSCP-PU session is desired on this link. If ACTPU Suppression = 1 (no SSCP-PU session) then the link is assumed to be T2.1 only. Otherwise, the link is assumed to be shared.

If the type of XID does not match the customized link type, this can result in the link not being established or being established with downgraded or shared link. The results depend upon the customized link type (that is, T2.0, T2.1 or shared) and the particular release of 3174 Configuration Support-C.

For 3174 Configuration Support-C releases prior to Configuration Support-C3, the 3174 uses customization information to determine what type of link to expect. During link initiation, the 3174 responds to the different types of XIDs as described in Table 4.

<i>Table 4. 3174 XID Processing Prior to CS-C Release 3</i>			
Customized Link Type	XID 0 or 1	XID 3 (2.1 only)	XID 3 (shared)
T2.0	T2.0	error	error
T2.1	error	T2.1	T2.1
Shared	T2.0 (downgrade)	T2.1 (downgrade)	Shared
None	error	T2.1	T2.1

With the advent of 3174 Configuration Support-C Release 3, the link type that is expected and accepted by the 3174 depends upon the customization information in combination with the type of actual XID received. How the 3174 responds (in Configuration Support-C Release 3 and later) to the XID is covered in Table 5.

<i>Table 5. 3174 XID Processing in Release C3 and Later</i>			
Customized Link Type	XID 0 or 1	XID 3 (2.1 only)	XID 3 (shared)
T2.0	T2.0	T2.1 (upgrade)	Shared (upgrade)
T2.1	error	T2.1	T2.1
Shared	T2.0 (downgrade)	T2.1 (downgrade)	Shared
None	error	T2.1	T2.1

1.5.1 Explicit Links

An explicit link can be homogenous (pure T2.0 or T2.1) or hybrid (shared T2.0/T2.1). Pure T2.0 links are used between the 3174 and the host when the connection is a traditional SNA subarea or between the 3174 gateway and its pure DSPU nodes. We concern ourselves with explicit links for APPN environments.

When we speak of APPN explicit link definition, we are speaking from a 3174 perspective. This means that for pure T2.1 or shared links, at a minimum we have coded the CPNAME, Node Type, and the DLC type of the adjacent node on the 3174 customization Network Resources panel or on the X.25 APPN Nodes panel if the DLC type is X.25. By supplying a DLC type and appropriate link address, or LCN or DTE for X.25, the 3174 NN has the authority to initiate the link using the defined CPNAME and Node Type. See Table 6 for appropriate addressing.

Table 6. Explicit Link Initiation	
Link Type	Link Addressing
X.25	LCN or DTE
Frame relay	DLCI
LAN	MAC address

The 3174 continuously attempts to initiate the link by sending XID Type 3. This means that if the node is unavailable, your link logs and MS Focal Point can become flooded with retries. For this reason, it is usually best to have the link initiated by the adjacent node, if the adjacent node is not an NN requiring a CP-CP session.

Note: If there is a CP-CP session required between two adjacent 3174s, the CPNAME of the adjacent 3174 must be explicitly defined on the Network Resources panel of both of the 3174s, unless one of the 3174s is an intermediate node for the other 3174 and that 3174 is a dependent LU requester (DLUR). If the latter is the case, the CPNAME of the intermediate 3174 need only be defined on the Network Resources of the 3174 serving as a DLUR.

If a link is explicitly customized as a shared T2.0/T2.1 link, the 3174 APPN function will downgrade the link to T2.0 at link activation time if the XID that is received from the adjacent node is type 1 (XID1). This is indicated by *DWNGRD* in the Status field of Online Test 17,2 (Adjacent Nodes). Explicit shared links are supported for all link types: LAN (token-ring and Ethernet), WAN (SDLC, X.25 and frame relay), and channel.

1.5.2 Dynamic Homogenous T2.1 Links

The very nature of APPN allows links and nodes to not be predefined throughout the network. Topology Database Updates are sent across the CP-CP session of network nodes to express any addition or subtraction of resources in the network. The 3174 as a network node has the ability to send and receive Topology Database Updates.

When a node attempts to communicate with the 3174 NN and it is not explicitly defined on the 3174 customization Network Resources, the 3174 allows this T2.1 connection as long as the number of links defined in customization Question 611 (Q611) is not exceeded.

All 3174 Configuration Support-C releases allow the 3174 to connect to APPN and/or LEN nodes using T2.1 links. The Network Resources panel is where you define nodes to which the 3174 should establish T2.1 links. However, you do not have to define all of these nodes. Network nodes that don't want CP-CP sessions, end nodes, or LENs may dynamically connect to the 3174. That is, the 3174 will allow an unknown node to bring up a T2.1 link. This means that APPN networks require less customization than hierarchical SNA networks.

Note: If no sessions (CP-CP or LU-LU) exist on the dynamic T2.1 link, the link will be deactivated by the 3174 NN. In other words, if the session count goes to 0, for a dynamic T2.1 link, the link will be deactivated.

1.5.3 Dynamic Shared Link

The Dynamic Shared Link support reduces the customization burden involved in defining links between the 3174 gateway and T2.1 nodes that also act as DSPUs.

Note: Dynamic shared links only pertain to LAN (token-ring and Ethernet) DSPU links. For WAN connections (channel, X.25, SDLC and frame relay) a shared link must be customized at the 3174 and resolved in the XID exchange.

Some nodes act simultaneously as APPN and non-APPN; that is, they handle both independent and dependent LU traffic on a single link. The 3174 uses a shared link to communicate with these nodes. A shared link carries both T2.1 and T2.0 traffic so that two links are not needed. In 3174 APPN releases prior to Configuration Support-C Release 3, shared links were not dynamic. In fact, they have to be customized in two places:

- The gateway customization Question 940 (Q940) on Ring Address Assignment panel for dependent traffic
- On the APPN Network Resources for the independent traffic

The result was that more customization was needed for shared link nodes than for other APPN nodes. Dynamic Shared Link support addresses this by removing the need to define a node on the APPN Network Resources panel if it already exists as a DSPU in Q940. Dynamic Shared Link support was first introduced in Configuration Support-C3.

Note: Dynamic Shared Link support, as with Dynamic Homogenous T2.1 Links support, does not address the issue of dynamic link support to network nodes requiring a CP-CP session.

With Dynamic Shared Link support, if the 3174 is customized for a T2.0 link, but receives an XID 3, then it brings up a T2.1 or shared link (depending on the ACTPU Suppression setting) if the total number of T2.1 links does not exceed the value specified for Q611 during 3174 APPN customization. The Configuration Support-C Release 3 and later dynamic shared link function is represented in Table 5 on page 31.

It is important to guarantee that all defined hosts can always successfully link to the 3174; therefore, hosts are always provided with shared links, whether they are customized for shared links or not. This way, if the 3174 reaches the T2.1 limit set for Q611, and the host requests a T2.1 link via an XID 3, the link request will not be rejected.

Dynamic Shared Link only affects nodes that are defined to the 3174 as needing T2.0 links. These nodes are DSPUs which use the 3174 gateway services on the LAN (token-ring and Ethernet) to access the SNA S/370 type host.

Note: Dynamic Shared Link is not applicable if the LAN address for the DSPU has not been coded in Q940. In other words, if an XID 3 is received from an adjacent node with the *ACTPU suppression* bit set to 0 (shared link requested), the link will be a T2.1 only.

1.5.3.1 XID Exchanges at the LAN Gateway

The gateway must be prepared to upgrade any DSPU to a shared or pure T2.1 link during the XID exchange process. Quite simply, if the gateway receives an XID 3 from a customized DSPU, it upgrades its view of the link.

Note: If a DSPU is already customized to be shared, the gateway assumes that the link is shared from the start of the link activation. Dynamic Shared Link addresses the case where the gateway begins by assuming that the link is T2.0.

The gateway always begins link activation by polling with a null (pre-negotiation) XID. The response of the partner node indicates whether or not the gateway should upgrade the link to *shared*.

Sometimes the DSPU will initiate the link activation. This may be done with a null XID, XID 0, or XID 3. In the case of an XID 0, the link activation will continue as a pure T2.0. If the link is initiated with a null XID, the 3174 responds with a null XID. If the DSPU comes back with a null XID as a response to the null XID 3174 sent, the 3174 sends a pre-negotiation XID 3, in case the partner needs a shared link. At this point, the DSPU will indicate its link requirements just as it does when the 3174 initiates the link. In the case where the DSPU initiates the link with an XID 3, the 3174 will do link activation based on the link characteristics indicated in the XID 3.

The 3174 cannot establish more T2.1 links than are specified in Q611 of 3174 APPN customization. In general, if the 3174 knows that T2.1 resources defined in Q611 have been exhausted, it will reject any requests for T2.1 link activation.

Sometimes, the 3174 may be involved in the simultaneous activation of many DSPUs before it knows the T2.1 link supply is exhausted. Usually when the DSPU(s) activates the link by using a null XID, the 3174 responds with a null XID to give the DSPU a chance to request a T2.1 link. If there are more requests outstanding than T2.1 resources available, the 3174 will respond to outstanding T2.1s with an XID containing an *out of resources* sense code.

1.5.4 Shared Link Customization Considerations

If APPN is not enabled (Question 510=0), all links with the 3174 are defined as T2.0 only.

If APPN is enabled (Question 510=1), the responses to 3174 customization will determine the type of link the 3174 expects between itself and another node. The responses will also determine how the 3174 will attempt to activate the link. The following description assumes that APPN is enabled.

1.5.4.1 3174 Models x1L/R LAN Gateway Links

The type of link that a 3174 gateway will attempt to activate between itself and a LAN (token-ring or Ethernet) attached node is determined by how the attached node is defined to the 3174 gateway and the XID exchange:

Node Definition	Expected Link Type
The node Local Area Network address/SAP is <i>not</i> customized in the 3174 gateway.	Type 2.1 dynamically
The node Local Area Network address/SAP is customized in the 3174 gateway in Question 940: LAN Address Assignment panel <i>only</i> .	Type 2.0 or dynamically shared based on the XID3 exchange
The node Local Area Network address/SAP is customized in the 3174 gateway in the Network Resources panel <i>only</i> .	Type 2.1 only
The node Local Area Network address/SAP is customized in the 3174 gateway in Question 940: LAN Address Assignment panel <i>and</i> in the Network Resources panel.	Type 2.1/2.0 shared

1.5.4.2 3174 Model x3R and x4R Links

The type of link that a 3174 Model x3R/x4R will attempt to activate between itself and another Local Area Network node (for example, a 3174/37xx gateway, or another 3174 Model x3R/x4R) is determined by how the other node is defined to the 3174 Model x3R/x4R.

Node Definition	Expected Link Type
The node Local Area Network address/SAP is <i>not</i> customized in the 3174 Model x3R/x4R.	Type 2.1 dynamically
The node Local Area Network address/SAP is customized in the 3174 Model x3R/x4R in Question 107: Gateway Address and Service Access Point <i>only</i> .	Type 2.0 only
The node Local Area Network address/SAP is customized in the 3174 Model x3R/x4R in the Network Resources panel <i>only</i> .	Type 2.1 only
The node Local Area Network address/SAP is customized in the 3174 Model x3R/x4R in Question 107: Gateway Address and Service Access Point <i>and</i> in the Network Resources panel.	Type 2.1/2.0 shared

1.5.4.3 3174 Channel Links to Host

The type of link that a channel-attached 3174 will attempt to activate between itself and the host is determined by the response to Question 242: Link Type.

Determining Parameters	Expected Link Type
Question 242 is set to 0 (T2.0 traffic only) and VTAM definition indicates PU T2.0 (no XID=YES on the PU definition; default is XID=NO).	Type 2.0 only
Question 242 is set to 1 (combined T2.0 and T2.1 traffic) and VTAM definition indicates PU T2.1 (XID=YES on the PU definition).	If DLUS name is not customized, shared If DLUS name is customized, T2.1 only

1.5.4.4 3174 Remote Links (Non-Gateway)

The type of link that a remote (SDLC, X.25 or frame relay) link-attached 3174 will attempt to activate between itself and other nodes is determined by the response to Question 510: APPN Network Controller and the XID exchange.

Determining Parameters	Expected Link Type
Question 510 is set to 0 (APPN not enabled).	Type 2.0 only
Question 510 is set to 1 (APPN enabled) and the attached node is a VTAM host Host definition indicates PU T2.1 (XID=YES on the PU definition)	If DLUS name is not customized, shared If DLUS name is customized, T2.1 only
Question 510 is set to 1 (APPN enabled) and the attached node is an AS/400 with dependent LUs. AS/400 has a APPC controller autocreated or explicitly defined for the 3174.	Type 2.1 shared
Question 510 is set to 1 (APPN enabled) and the attached node is non-subarea. The node LAN/SAP address or DLCI is customized in the 3174 Network Resources panel	Type 2.1 link

Note: For X.25 links, the Physical Unit ID (PUID) customized in Question 215 is not sent as a part of the XID, when the link is pure Type 2.1 or shared. This can cause the link to fail or generate an unexpected link type if the attached node checks this value.

1.5.5 Mismatched Link Types

In customizing a 3174 network node, it is important that the nodes at both ends of a link define the same link type. If the link types do not match, one of the following occurs:

- The link may not activate, as is the case with channel host links.
- The link may activate differently than one of the nodes expects, depending on the negotiation during XID exchange between the two nodes.

This is the case with LAN (token-ring or Ethernet) links or remote links (X.25, SDLC, and frame relay).

Link type negotiation during XID exchange will result in the *lower* of the two link types expected. For example:

- If node A expects the link to be T2.1 shared and node B expects the link to be T2.1 only, then the resultant link will be T2.1 only.
- If node A expects the link to be T2.1 shared and node B expects the link to be T2.0 only, then the resultant link will be T2.0 only.

Figure 8 shows an example of VTAM definitions and 3174 customization responses required to provide shared link support.

1.5.6 Shared Link Customization Example

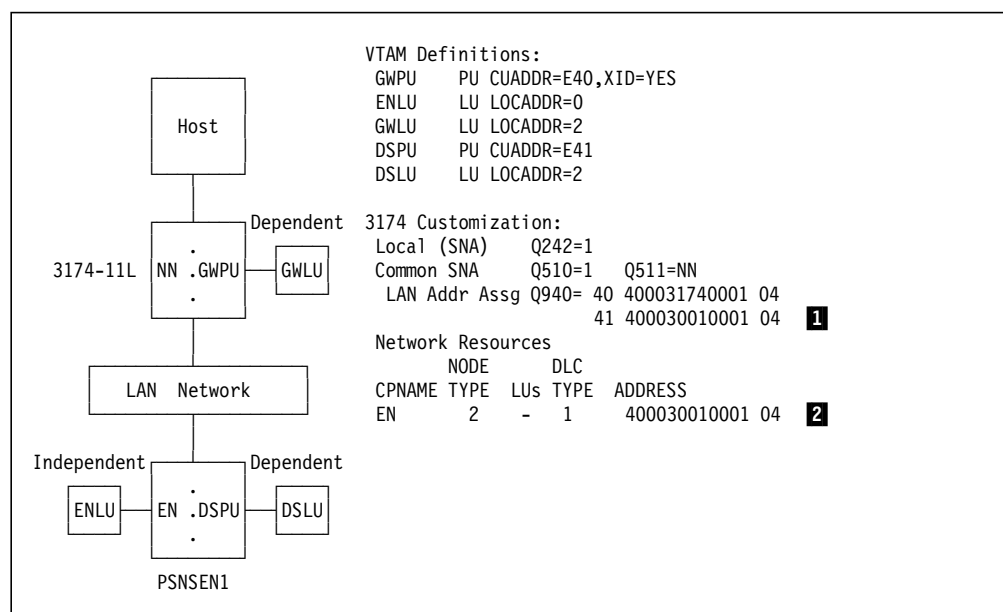


Figure 8. Shared T2.0/2.1 Link Example

In this example, a 3174-11L is both a network node and a Local Area Network gateway. We will assume that we require an APPN connection to the host. The 3174-11L will, therefore, require a shared link to the host to transport T2.0 and T2.1 traffic. We respond to Question 242: Link Type with a 1 when customizing the 3174-11L. When Question 242=1, this indicates that the link to the host is able to carry both T2.0 and T2.1 traffic.

For the host to support a T2.1 link from the 3174-11L, it must have the right levels of VTAM (and NCP if the 3174 is remote-attached). In addition, the host PU definition for the 3174-11L must specify XID=YES.

Similarly, PSNS1 is both an APPN end node and a downstream PU. PSNS1 requires a shared T2.0/2.1 link to the 3174-11L network node/LAN gateway. In order to have a shared link with the 3174-11L, PSNS1's Local Area Network address/SAP must be customized in both of the following:

- 1** Question 940: LAN Address Assignment panel as a downstream PU
- 2** In the Network Resources panel as an end node

By having shared link support, T2.0 traffic from the 3174-11L LU (GWL) and T2.1 traffic from the end node portion of PSNSEN1 (ENLU) uses the same link station address (CUADDR=E40) to reach the host. The T2.0 traffic from the downstream PU portion of PSNSEN1 uses the other link station address (CUADDR=E41) to reach the host. Thus, we can see that both the link from the 3174-11L to the host and the link from the 3174-11L to PSNSEN1 are shared T2.0/2.1 links.

The following points should be noted about the VTAM definitions:

- The independent LU (ENLU in this example) is defined under the PU definition for the 3174-11L. When a 3174 network node is attached to the host subarea, all independent LUs in the APPN network are associated (from the host's perspective) with the boundary-attached 3174, regardless of the actual physical location of the independent LUs.
- The PU definition for the 3174 attached to the subarea (GWPU in this example) is always required.
- If a downstream node in the APPN network does not contain any dependent LUs, does not require SSCP-PU services and contains only independent LUs, then no PU definition is required for that node.

1.6 3174 and VTAM SSCP Takeover

SSCP takeover, prior to VTAM Version 4 Release 1, was strictly an SNA subarea VTAM function. The 3174, prior to Configuration Support-C3, participated in SSCP takeover by accepting the non-activation XID 3, but ignoring most of the contents such as CP name, CP capabilities, TG number, and CP-CP session. Since this is not valid processing, particularly when communicating in the subarea/APPN world of VTAM Version 4 Release 1, the processing has been changed in microcode Configuration Support-C Release 3 and later.

In an APPN network, multiple non-activation XID 3 may have to be exchanged to complete the SSCP takeover. One of the XIDs is sent by the link owner to inform the adjacent node that the CP-CP session no longer exists. Once the actual takeover has been completed by the involved VTAMs and NCPs, a final non-activation XID 3 is sent to inform the adjacent node of the new CP name, CP capabilities, TG number and CP-CP session support. The ability to accept these changes via a non-activation XID 3 is indicated by the *CP Name Change Support Indicator* (byte 9, bit 7) of the initial link XID 3 exchange.

Figure 9 on page 39 is an example of an SSCP takeover that involves:

- CP name change
- TG number re-negotiation
- Parallel TGs

These are used for a 3174 that is customized for Single Link Multiple Host (SLMH) support.

Note: Not all information exchanged in the initial XID 3 exchange can be changed by the subsequent non-activation XID 3: in particular, ACTPU Suppression, PU name (control vector), and Adjacent Link Station name (control vector).

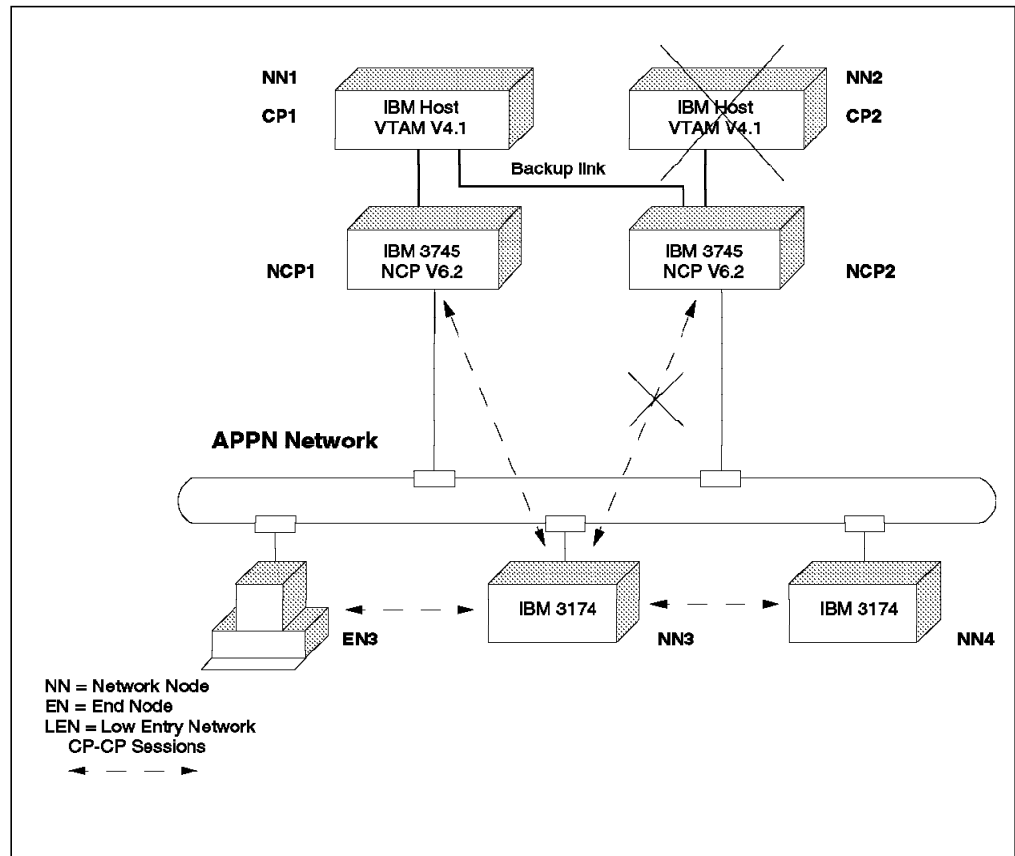


Figure 9. Example of SSCP Takeover

Since the LEN CP name is not always valid as a result of SSCP takeover, the CP name of the LEN host needs to be associated with a link address or the PU name of the NCP. This is done to ensure that the LEN host a CP name is associated with is known, under the condition that a CP name other than the one defined is included in the XID3 for a specific link address or node.

1.6.1 SSCP Takeover Before Link Establishment

Because SSCP takeover can occur before the 3174 establishes a link with the LEN SSCP node, 3174 link establishment has to handle the case where the XID3 contains a different CP name than that which was customized. This situation can occur whenever the node is configured on the Network Resources panel of the 3174 APPN customization.

When the CP name changes before the link is established, the 3174 must have some way of correlating LUs defined for a LEN SSCP with the link, since the CP name has changed and no longer serves this purpose. This correlation can be provided in two different ways:

1. By customizing a DLC type (and address for LAN or DLCI for frame relay) on the Network Resources panel

Note: For SDLC and parallel channel, it is not necessary to specify the address on the Network Resources panel since it is the same as the address given in Question 104.

2. By customizing a PUNAME on the Network Resources Qualifiers panel shown in Figure 42 on page 84

If the DLC type (and address for LAN or DLCI for frame relay) for a LEN-SSCP node is specified on the Network Resources panel, the LUs defined for that LEN-SSCP node will always be associated with that link, regardless of the CP name (or PUNAME) specified in the XID3 during link establishment.

If the PUNAME is specified instead of the DLC type, it will be used to provide the correlation of LUs to the link during link establishment. This is described in more detail below.

During link establishment with a LEN-SSCP (XID3 indicates T4/5 node, and no NN support), the following occurs:

1. If the link carrying the XID3 already has LUs associated with it (because the DLC type/address was customized on the Network Resources panel), the CP name in the XID3 is ignored and the link establishment proceeds.
2. If the link carrying the XID3 does not already have LUs associated with it, but the XID3 contains a PUNAME, the customization data will be searched matching PUNAME. If found, the CP name and LUs belonging to the PUNAME are associated with the link being established. If the PUNAME is not found, the link establishment continues using the CP name from the XID3.
3. If the link carrying the XID3 does not already have LUs associated with it, and the XID3 does not contain a PUNAME, the link establishment continues using the CP name from the XID3.

1.7 Transmission Groups (TGs)

A Transmission Group is the logical link that connects two adjacent link stations when using Data Link Control (DLC) connections. These logical links, in a pure APPN environment, are over a single physical link. In a VTAM/APPN environment, it is possible to have logical links (TGs) over multiple physical links. The 3174 also supports multiple physical links via its multi-host support. With the 3174 multi-host support, you are able to define multiple physical links to host systems. So, in short, you can have single-link and multiple link-TGs in a 3174 APPN environment. The TGs can further be defined by how they connect to an adjacent node; that is they can be one of the following:

- Parallel TGs
- Multiple TGs

1.7.1 Parallel Transmission Groups

Parallel Transmission Groups are multiple logical links to links to the same node. Configuration Support-C Release 3 and later support parallel TGs for the following conditions:

- 3174 single link multiple host (SLMH) support to a LEN/Subarea with no APPN involvement
- 3174 NN to other APPN nodes

The 3174 NN only initiates parallel TGs when the host link is frame relay, X.25 or LAN (token-ring or Ethernet) and the 3174 has been configured for single link multiple host (Q101=M, multi-host support). Partner nodes can initiate parallel links as long as they are not LEN nodes.

Each TG is uniquely identified via a *TG number*. For the 3174, this number is negotiated at link activation time and changes only if the link is deactivated and reactivated or during SSCP takeover. TG numbers are not customizable (predefined) at the 3174. The 3174 handles the case where adjacent node has specified a redefined TG number. Predefined TG numbers range from 1 through 20. Negotiable TG numbers range from 21 through 239.

Predefined TG numbers are conveyed during the XID pre-negotiation phase via a TG descriptor (X'46') control vector with the TG identifier subfield (X'80'). If the number specified is already in use at the 3174 (receiving node), the XID exchange is terminated.

Parallel TG Considerations for LEN Connections:

T2.1 node architecture does not allow the establishment of parallel TGs (links) to LEN nodes. Even if it were not an architecture restriction, allowing parallel TGs to link to a LEN-SSCP could cause the 3174 difficulty in associating LUs with a particular link for SSCP takeover scenarios. See 1.6.1, "SSCP Takeover Before Link Establishment" on page 39 for a description of how LUs are associated with a link when the CPNAME changes (SSCP takeover occurs) before the link is established.

The following situations are recognized as requests to initiate a parallel TG to a LEN node:

- Receiving XID 3 with CPNAME matching a currently established link to a LEN node
- Receiving XID 3 with PUNAME matching a currently established link to a LEN node

For the above situations, the 3174 will take one of the following actions:

- If the new request is from a LEN-SSCP node (XID 3 indicates T4/5 node, and no NN support), 3174 responds with XID 0 to downgrade the new link to T2.0 only. This allows the dependent LUs to be supported, but the link is not used to route APPN traffic.
- If the new request is from a non-SSCP LEN node, the XID 3 is rejected with a XID negotiation error (X'22') control vector containing the sense code X'10160011', indicating that the predefined TG number is not in agreement.

1.7.2 Multiple Transmission Groups (TGs)

First of all let's state the difference between *Multiple TGs* and *Multi-link TGs* (*Multitail*). Multiple TGs occur when a node has TGs connecting to more than one adjacent node. The 3174 NN has always had this capability. Multi-link TGs (*Multitail*) are really a SNA subarea phenomenon, in that they allow for multiple logical links in the LEN subarea. Multi-link support was first introduced in Configuration Support-C3.

1.8 Border Node Support

In subarea networking, subarea networks may need to communicate with one another while still maintaining their independent identities. SNA Network Interconnection (SNI) was developed to meet this requirement.

In APPN networking the same requirement exists for independent APPN networks, those with different NETIDs, to communicate. An APPN network node can, however, only have CP-CP sessions with another network node if they use the same NETID. The solution to this multi-network connectivity requirement is a *border node*.

A border node can connect to an APPN network node with a different NETID, establish CP-CP sessions with it, and allow session establishment between LUs in different NETID subnetworks. Topology information is not passed between subnetworks. Similarly, a border node can also connect to another border node.

Border node support can be split into two areas:

- Border node interoperability (coexistence)
- Border node function

Configuration Support-C5 takes advantage of the border node function provided by adjacent nodes by implementing border node interoperability or coexistence.

The 3174 running Configuration Support-C3 or 4, does not provide border function or coexistence. This means that the only time a connection can be made between the 3174 and an adjacent node that has a different NETID is when the adjacent node is either:

- Subarea LEN
- APPN EN

Two types of border nodes are defined in the APPN architecture (peripheral border node and extended border node).

The peripheral border node enables the connection of network nodes with different NETIDs and allows session establishment between LUs in different, adjacent NETID subnetworks. A peripheral border node provides directory, session setup, and route selection services across the boundary between paired subnetworks with different NETIDs while isolating each subnetwork topology updates and the storage requirements for the network topology database on network nodes in each of the network partitions.

The extended border node function, on the other hand, allows the connection of network nodes with different NETIDs and session establishment between LUs in different subnetworks that need not be adjacent.

OS/400 Version 2.1 supports the peripheral border function while VTAM 4.2 supports both the peripheral and extended border node functions.

1.9 Dependent LU Requester

Physical Unit (PU) type 2.0 and dependent LU support, as they have existed prior to Configuration Support-C5, do not allow the dependent LUs to take advantage of APPN routing. The SSCP (host) must be boundary-attached to the 3174 in order for dependent LUs to function. The dependent application must reside in the SSCP or in the subarea domain that contains the SSCP.

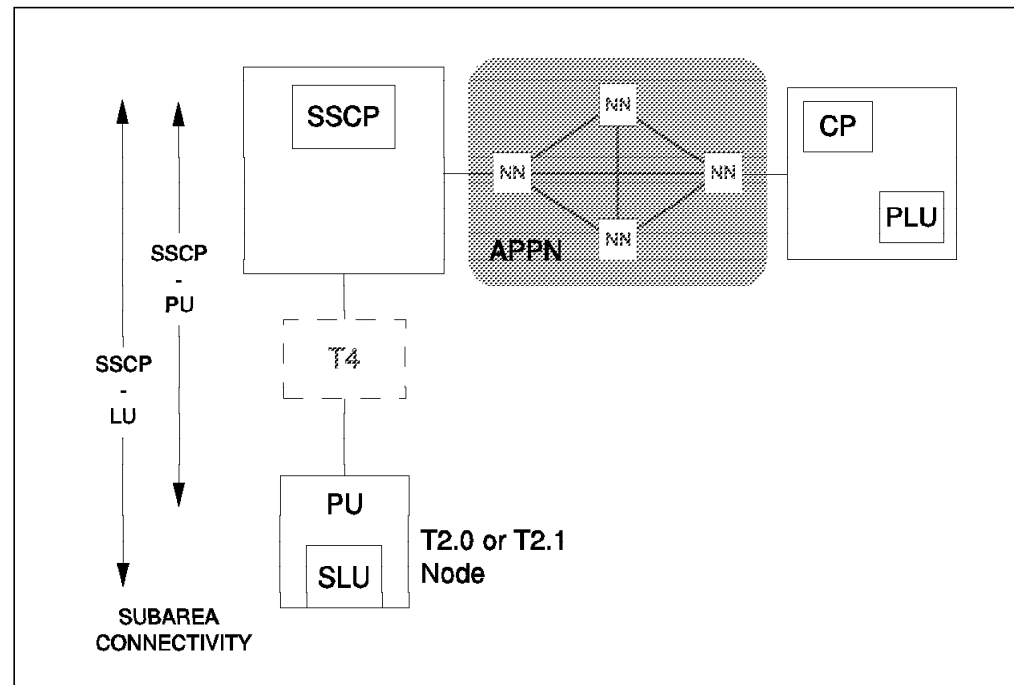


Figure 10. Dependent LU SSCP Connectivity without Dependent LU Requester/Server. The SLU-PLU session can use APPN between the composite network node and the node containing the PLU but must use subarea connectivity for SSCP-PU and SSCP-LU sessions.

Due to the hierarchical structure of SNA, an SSCP-PU session must be established before an SSCP-LU session can exist. Likewise, the SSCP-LU session must be established before the LU-LU session can exist. An ACTPU request and an ACTLU request must therefore be successfully processed before a BIND request can be accepted by a 3174 dependent LU. The host application is always the primary dependent LU (PLU) and the 3174 dependent LU is always the secondary dependent LU (SLU). Dependent LUs are identified by LU addresses in the transmission header (TH) of a PIU (path information unit). A PIU for a PU type 2.0 consists of a 6-byte TH followed by a 3-byte RH (request/response header). An RU (request/response unit) may follow the RH. Consequently, the limitations of this environment are:

- Dependent devices cannot take advantage of APPN routing.
- The primary LU or application must reside in a node that contains an SSCP.
- PLU-SLU traffic must flow over a host link.

Now, with the latest APPN architecture and Configuration Support-C5, the establishment of SSCP-PU/LU and LU-LU sessions and the environment in which these sessions exist has changed. A new CP-CP session (LU6.2) has been introduced. The mode CPSVRMGR is used to identify a session between a DLUS and a DLUR, two new components that reside in the CPs. DLUS is the dependent LU server and DLUR is the dependent LU requester. The DLUS resides in a network node that contains the SSCP function (VTAM V4R2). Now all SSCP-PU/LU flows are encapsulated on the CP-SVR (CPSVRMGR) pipe between the DLUS and DLUR. The DLUS-DLUR pipe is very similar to the CP-CP sessions identified by the CPSVCMG mode. A new GDS variable has been introduced, X'1500', which will contain the FID2 PIU of SSCP-PU/LU flows. Two new transaction programs (TPs) now exist to encapsulate and de-encapsulate the SSCP-PU/LU flows.

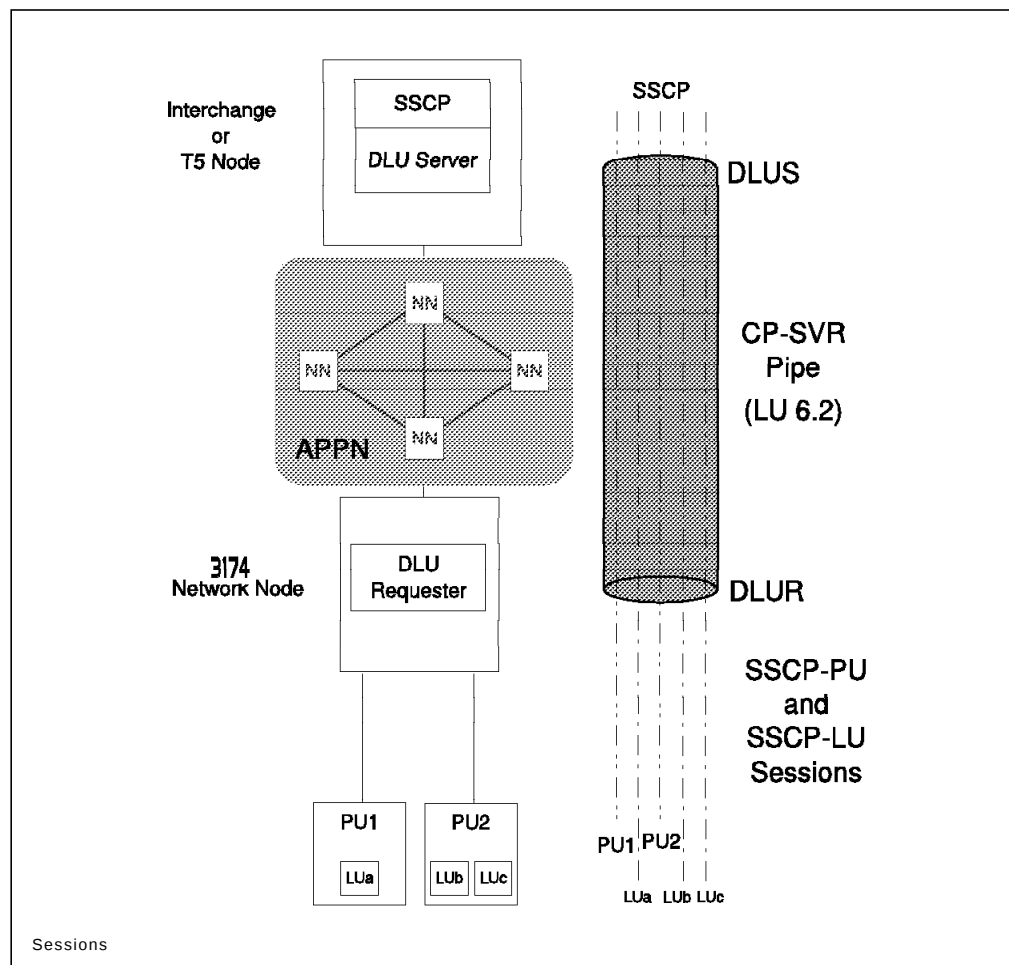


Figure 11. CP-SVR(CPSVRMGR) Pipe and Encapsulated SSCP-PU and SSCP-LU

With the introduction of DLUS/DLUR, the dependent application no longer has to reside in the domain that contains the SSCP function. The PLU (dependent application) may now get to the SLU (device coaxially attached to the 3174) through the APPN network. The BIND request which establishes the LU-LU session will not be encapsulated on the DLUS/DLUR pipe. PLU-SLU sessions will now be associated with an LFSID (local form session identifier) instead of the OAF/DAF of dependent SNA. The end points (DLUR and AWP230 function of PLU node) will translate from LFSID to OAF/DAF for the dependent LUs. The dependent LUs will locate each other in the APPN network via LU names.

The encapsulated ACTLU request contains an LU name which will be associated with an LU address by the DLUR. The BIND request from the PLU to the SLU also contains an LU name, and the BIND request will be extended to contain APPN routing information (RSCVs) and the LU name being used to correlate LFSID to LU address (OAF/DAF). Consequently, dependent PLU-SLU sessions no longer have to go through the SSCP, as we now have dependent APPN LUs. An SSCP-LU session must exist before a PLU-SLU session may be established. However, if the SSCP-LU session or SSCP-PU session is terminated, the PLU-SLU session may continue to exist. Prior to DLUR, the PLU-SLU session was always terminated immediately if the SSCP-PU/LU session was terminated.

The 3174 network node provides DLUR support for coax-attached dependent terminals (CUT and DFT) and printers. As long as a path exists from the 3174 DLUR to the VTAM DLUS and a path exists from the DLUS to 3270 applications, these applications may reside anywhere in the APPN network or an adjacent APPN subnetwork. Since boundary attachment is not required, the 3174 DLUR can be anywhere in the APPN network.

1.9.1 Implementation Considerations

There is no DLUR support for downstream PUs on the 3174, or for dependent LUs on downstream PU 2.0s.

Since APPN is not supported on CCAs, PUs on CCAs are not served by a DLUS. PUs on CCAs must continue to receive SSCP services as they do currently.

PUs are identified using the PUID from configuration Question 215. The PUID is sent by the DLUS in CV46 of the encapsulated ACTPU.

No new HOST ID or HOST connection type for a DLUS-served PU is required. The DLUS-DLUR pipe may be established over a non-host link.

In order for 3174 to initiate the DLUS-DLUR pipe, the DLUS name must be configured during customization of the 3174.

In order for DLUR to function, there must also be a DLUS.

Currently, only ACF/VTAM has committed to providing DLUS support.

DLUR nodes may be either NNs or ENs; the 3174 can only be a NN.

A DLUS may only be an NN.

The DLUS and DLUR nodes do not have to be in the same subarea or subnet, so LUs can be routed across subnetworks through border nodes.

Backup and recovery for links and nodes is available without additional definitions and without requiring the user to switch to another logical terminal.

Dependent LUs can use traditional network management including RTM.

The DLUR/DLUS function supports SSCP takeover and giveback. Another VTAM can assume ownership of the DLUS function and relinquish that takeover with an operator-initiated command.

1.9.2 Operational Changes

There are some modifications to the RAS panels due to the way a PU may be activated as a result of the additional sessions that are now possible between control points, and due to the dependent LU-LU sessions that may exist in the APPN network.

There is one minor change to the MODE/COS name definition utility. The reserved names list includes CPSVRMGR. Therefore, if CPSVRMGR is used as a MODE/COS name, it is flagged as an error.

1.10 Central Directory Client

VTAM V4R1 contains a central directory server (CDS). Beginning with Configuration Support C Release 5, when a CDS is active in VTAM, the 3174 NN can issue directed searches to the CDS instead of issuing a broadcast search. In other words, the 3174 can be a central directory client. Because a CDS can receive search requests from many NNs, its directory database grows faster and contains more resources. This centralization reduces the number of broadcast searches that are sent by the 3174 NN.

There is no 3174 customization requirement for Central Directory Client.

1.11 Network Management

3174 network management is enhanced in Configuration Support-C5 to allow the transport of alerts on the CP-CP session to a focal point. This removes the boundary-attached limitation that exists today. The focal point can be any of the Management Services products such as IBM LAN Manager, OS/400 or NetView.

Prior to Configuration Support-C5, the 3174 had to be boundary-attached to the host for network management. The 3174 required an SSCP-PU session for network management even when customized as an APPN node. This meant that there had to be a program such as NetView installed on the host to receive the SNA alerts.

In this case, the 3174 APPN network node acts as a pseudo-alert focal point for the end nodes it serves. The end nodes build the generic alert and send it to 3174 in Control Point Management Services Unit (CP-MSU) format using MDS. The 3174 APPN network node converts the alert format from CP-MSU into Network Management Vector Transport (NMVT) and sends it on the SSCP-PU session to the NetView focal point.

The new support allows 3174 generated alerts, and alerts from served ENs, to be transported on a LU 6.2 session to an alert focal point. The new support also provides the MDS routing function for MS applications in ENs served by the 3174 NN. This allows the ENs to utilize the CP-CP session with the 3174 NN for any MS application data, and eliminating the need for ENs to support separate LU-LU sessions with MS application partners.

1.11.1 Summary of Enhancements

- Reporting to EXPLICIT Focal Point

For this function, the 3174 responds positively to requests from a focal point for *any* category of service. Although the 3174 only uses the alert category, served ENs may have unsolicited data that needs to be reported to a focal point for other categories. For example, OS/2 ES has support for *send message to operator*, an unsolicited flow in the *Common Operations Services* category. If attached as an EN to the 3174, it must receive the focal point notification for this category from the 3174.

- Reporting to IMPLICIT Focal Point

For this function, the 3174 specifies the desired focal point for alerts through a configuration option and initiates communication to the focal point. If the communication fails, the 3174 retries periodically.

- Acquiring BACKUP Focal Point

This function allows switching to a backup focal point, if one has been designated explicitly by the focal point. No configuration option is provided to specify a backup focal point for alerts. If no backup focal point is defined, the 3174 reverts to the SSCP as the focal point when the primary focal point is lost.

- Entry Point Function for 3174 Alerts

This function allows alerts generated by the 3174 to be sent to the active alert focal point. If the alert focal point session does not exist, the 3174 assumes the SSCP is the focal point, and sends alerts on the SSCP-PU session to the appropriate host.

ISDN CMIP events are not alerts, and continue to be sent on the SSCP_PU session.

- MS Application Routing to/from Served ENs

This support provides Management Services routing functions, so that MS applications in served ENs can communicate with MS applications in other nodes (regardless of focal point affiliations). This function includes the forwarding of unsolicited data such as alerts to the alert focal point, and the conversion of alerts from back-level nodes to MDS_MU format.

1.12 Connection Networks

When two nodes are physically attached to the same transport facility, such as a token-ring network, it is advantageous (for example, for performance reasons) to establish *direct* connections between those two nodes when they wish to communicate rather than being routed via an APPN intermediate network node.

To achieve direct connectivity between two nodes, however, one node must be defined in the other node and vice versa. In a large APPN network, direct any-to-any connectivity may not be possible because of the enormous task of coordinating definitions, especially if the network topology changes frequently. This is where a connection network can be used.

The concept behind a connection network is that a shared access transport facility (SATF) such as a token-ring network can be considered a virtual node in an APPN network. This virtual node is also known as a connection network and is referred to by its name. Since it is a node in an APPN network, route selection services can calculate routes that go through this virtual node or connection network.

All nodes that are on the same SATF can be defined to attach to the same connection network. Each attaching node defines DLC signalling (addressing) information about itself such as its token-ring address and SAP. In addition, it specifies the name of the connection network. All nodes attached to the same connection network will, therefore, specify the same connection network name.

When communication needs to be established between two nodes, route selection services will find out that both nodes are attached to the same connection network. The routing information that is returned to the initiator of the route request will contain the DLC signalling information of the destination. The initiator can then establish a direct outgoing connection to the destination. Thus, without massive predefinition, any initiator can reach any destination on the same connection network.

A connection network may be used by network nodes and end nodes. A connection network cannot be used by LEN nodes because it can't send a topology database update (TDU) indicating that it is connected to a virtual routing node (VRN).

A connection network reduces the addressing information stored at each node and the number of topology database updates (TDUs) that are sent about each network node—network node connection. By defining network nodes in the same connection network, the number of entries and TDUs are reduced from $n \bullet - n$ (n squared minus n) to n , where n is the number of network nodes in the APPN network. This is a very significant reduction when there are many nodes in a network.

A connection network may be used for intermediate routing purposes between network nodes but offers advantages especially for end nodes. Once the direct route to the destination is known, the session traffic can flow between two end nodes without passing through the network node server at both ends. Direct communication between end nodes can significantly enhance the performance of the network.

With a 3174 network node, its attachment to a connection network is specified via Question 512: APPN Virtual Node Name on the Common SNA panel.

1.12.1 Connection Network Definitions

Figure 12 shows an example of the relationship between definitions in the end nodes and the 3174 network node server required to implement a connection network.

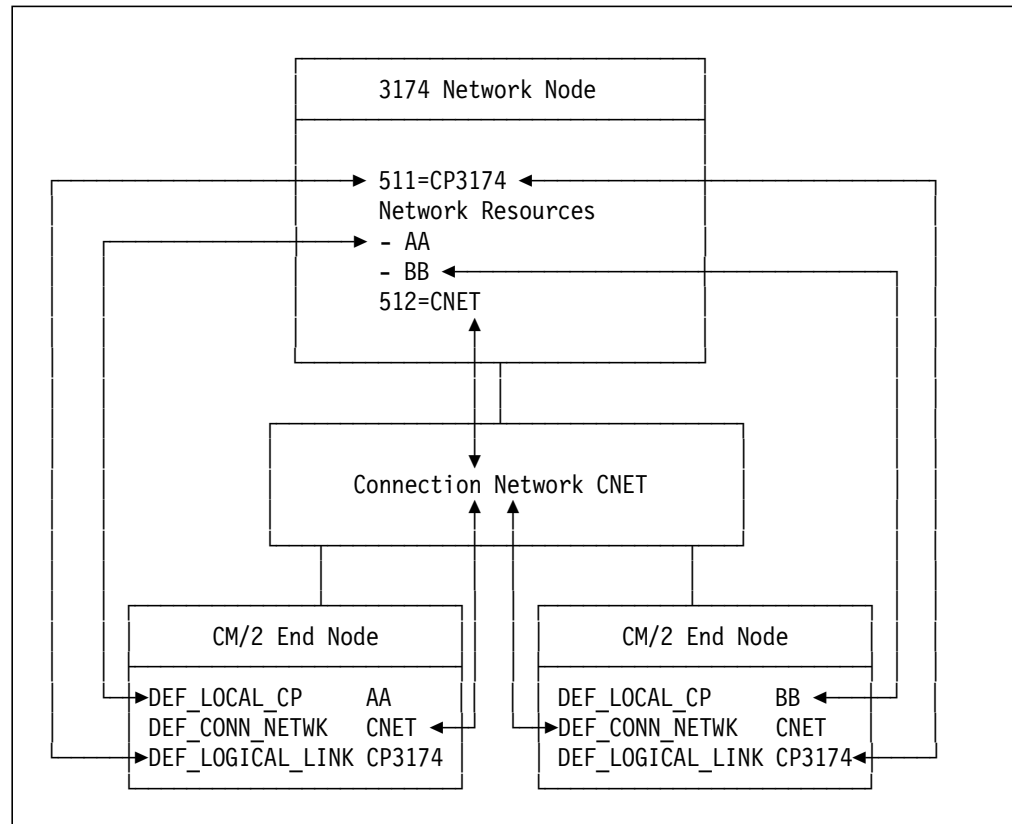


Figure 12. Relating Definitions Used in a Connection Network

In this example:

- All nodes attached to the same connection network specify the same virtual node or connection network name.
- All nodes define their own control point.
- Links are defined between each end node and its network node server.

If an LU in end node AA wants a connection to end node BB, AA asks the network node server (CP3174 in this example) for the shortest route to BB. This is the route through the connection network CNET. CP3174 gives AA the addressing information of BB. AA then establishes the session to BB directly, bypassing the network node server.

In this example, the end nodes AA and BB are defined as network resources in the 3174. To reduce customization further, AA and BB *need not* be defined as shown because they are end nodes and are, therefore, able to register themselves with the 3174 network node server via CP-CP sessions.

1.13 Online Tests (RAS)

There are three online tests available in Configuration Support-C that pertain directly or indirectly to 3174 APPN support:

Online Test 3 Provides the user with the status of all configured devices that are directly attached to the controller. This test only pertains to APPN when the 3174 has been customized as a dependent LU requester.

Online Test 15 Provides the operator with a view of the operational status of the host configured on the network. This includes all of the physical host links supported by 3174 as well as dependent LU requester/server links.

Online Test 17 Provides the user with a snapshot in time of the network as it appears to the 3174. Status is provided on the current status of the 3174 network node, link and sessions. You can also view information on adjacent nodes, pending session routes, and active locate requests.

As with all 3174 Online Tests, a CUT capable device is required. This can be a 3270 terminal or a IWS running 3270 emulation software in CUT mode.

1.13.1 Test 3, 3270 Device Status

A new option has been introduced for the 3270 Device Status Test 3 to allow the displaying of the DLUR port connectivity for individual ports. The new option is /5.

Via option /5, the following information is displayed for each LT:

- SLU name (not qualified)
- Link ID for the LU-LU session
- DLUS CP name
- CP name of the PLU node

Test 3, Option 5 - The DLUR Connectivity Display

LU Name The network name of the secondary logical unit received in the ACTLU request from the DLUS

DLUS CP Identifies the control point name of the DLUS node

PLU CP Identifies the control point name of the node containing the primary logical unit (application)

PLU-SLU link ID Identifies the link on which the PLU-SLU session exists

```

_____ DLUR Connectivity for PN 03, HG 26 _____

Adapter (HG) status:      Enabled
Port (PN) status:        Powered on
Device type:              Video display (MLT)

Current connectivity-

      LT   LU Name   DLUS CPNAME   PLU CPNAME   PLU-SLU Link ID
      1    S3174105  USIBMRA.RAI   USIBMRA.RAI   1
      2    S3174122  USIBMRA.RAI   USIBMRA.RAI   1
      3    S3174123  USIBMRA.RAI   USIBMRA.RAI   1
      4    S3174124  USIBMRA.RAI   USIBMRA.RAI   1
      5    S3174125  USIBMRA.RAI   USIBMRA.RAI   1

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  12=Test Menu

```

Figure 13. The 3174-11R DLUR Connectivity Display

1.13.2 Test 15 - 3270 Host Status Summary

The panel for 3270 Host Status Summary (Test 15) has been changed to allow DLUS as an attachment type. When DLUS is the Attach type, the connection status field will indicate Active or Inactive (SSCP-PU session state).

Test 15, Option 15

```

_____ 3270 Host Status Summary _____

ID   Host Descriptor   HG   Attach   Connection
      Status
1A   3270 host         DLUS Active

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  5=Refresh  12=Test Menu

```

Figure 14. 3270 Host Status Summary Panel

1.13.3 Test 17, APPN Tests

```

_____ APPN Test Menu _____

Option      Description

   1        Display Node Status
   2        Display Adjacent Nodes
  3,N.C     Display Link Status  N.C = NETID.CPNAME
  4 ,x      Display Session Status
            x = Status Type; P=Pending, A=Active, T=Terminating
  5,P.N.C   Display Pending Session Route  P.N.C. = PCID.NETID.CPNAME
   6        Display Active Locate Requests
   7        Display Local LU 6.2 Session Status

NOTE: The Link Status Test can also be run by executing the
      Adjacent Nodes Test and selecting a LINK ID.
      The Pending Session Route Test can also be run by executing
      the Session Status Test and selecting a SESSION NUMBER.
      PCID, NETID, and CPNAME parameters are case sensitive.

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF:  3=Quit  12=Test Menu

```

Figure 15. Online Test 17 - APPN Test Menu

The options that are available for Test 17 are:

Test 17 Option 1 - Display Node Status: Option 1 displays the Node Status for the 3174 network node.

```

_____ Node Status _____

NETID: USIBMRA      CPNAME: CP31741      Type: NN      Max Links:  20

Adjacent End/LEN Nodes
Customized:    2      Active:    0

Adjacent Network Nodes
Customized:    0      Active:    0

Max Intrmed Sessions:  225      Active Intrmed Sessions:  0

Registered Entries:    0      Home Entries:    2

Cache Entries:    0      Rte Add Res: 128

Pool Buffer Usage:  0 %      Congestion: NO

Data Buffer Usage:  0 %      Session Resource Depletion: NO

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF:  3=Quit  5=Refresh  12=Test Menu

```

Figure 16. Online Test 17,1 - Node Status

Test 17, Option 2 - Display Adjacent Nodes: Option 2 displays the ID information for the nodes adjacent to the ones that currently have a link defined, active or in process of activation. A link status test can be initiated (Option 3) by inputting the LINKID on the command line of the Option 2 menu.

Since Configuration Support-C Release 3 and later provide the ability to have parallel TGs (multiple links to the same adjacent node), the panel for test now includes information about all sessions dispersed over these links.

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
1	USIBMRA	RALYAS4B	EN	OPEN	01	0	YES
2	USIBMRA	PS2ENET	EN	CLOSED	01	0	NO

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 17. Online Test 17,2 - Adjacent Nodes

Test 17, Option 3 - Display Link Status: Option 3 displays the network name (NETID and CPNAME), type, link status and state, Route additions Resistance, Bind receipt status, Bind send status, shared link support, number of APPN sessions for the link, congestions, resource depletion, adapter DLC type, address of the 3174, TG number, adapter hardware group, the address of the adjacent node and the product identifier.

Link Status							
NETID	CPNAME	Type	Status	State	Route Addition Resistance		
USIBMRA	PS2ENET	EN	CLOSED	01	0		
RCV Slam	SND Slam	Combined PU 2.0	Number APPN Sess		Congestion	Session Resource Depletion	
NA	NA	NO	0		NO	NA	
Adapter Type	Local Address		TG	HG	Remote Address	Product Information	
ENET	400031740001		00	41	40003174199204		

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 18. Online Test 17,3 - Link Status

Test 17, Option 4 - Display Session Status: Option 4 displays information for all intermediate sessions or selected sessions.

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	F0FB39DB634D9727	USIBMRA	WTR33364	ACTIVE	00	WTR33364	BA33305
2	D1FB0A1363342050	USIBMRB	BA33305	ACTIVE	00	BA33305	WTR33364
3	F0FB39DB644D9727	USIBMRA	WTR33364	ACTIVE	00	WTR33364	BA33305

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 19. Online Test 17,4 - Display Session Status

Test 17, Option 5 - Display Pending Session Route: Option 5 specifies the route that a selecting *pending* session travels to get through the network.

Pending Session Route					
Hop	From NETID	From CPNAME	To NETID	To CPNAME	U
1	USIBMRA	PCOM5250	USIBMRA	CP31741	
2	USIBMRA	CP31741	USIBMRA	RALYAS4A	

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 20. Online Test 17,5 - Display Pending Session Routes

Test 17, Option 6 - Display Active Locate Requests: Option 6 displays all active locate requests with the FQPCID, the node that sent the request, and the LUNAME of the resources being located.

Active Locate Requests				
FQPCID	N	RCVD From	Out	LUNAME
-----	-	-----	---	-----
F1C370EFB7B195C5.NETBL04.CDRM4	23	USIBMRA RAI	1	USIBMRA RAON8

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 21. Online Test 17,6 - Display Active Locate Requests

Test 17, Option 7 - Local LU 6.2 Session Status: The APPN test menu contains a new option. A new panel similar to the session status panel is added to show the independent session status of all LU6.2 sessions that have an end point in the 3174. This panel is new for DLUR support and contains the following information for LU6.2 sessions that terminate in the 3174.

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
-----	-----	-----	-----	--	-----	-----
EE4B78FF24186E41	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CP31741
EE4B7AFF00000001	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31741

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 22. Local LU 6.2 Session Status

Information for up to 15 sessions appears on each panel. If there are additional sessions, use the PF8 key to page forward to the next panel. Use PF7 to page back up to the previous panel. PF5 refreshes the Local LU 6.2 Session Status panel and displays the updated information.

PCID A unique identifier assigned to the session by the origin node

NETID Identifies the network of the node originating the bind request

CPNAME Identifies the control point name of the node originating the bind request

PCID, NETID and CPNAME make up the fully qualified PCID (FQPCID).

Status Shows the current status of the session. Valid values are:

PEND Session pending activation

ACTIVE Session active

TERM Session pending Termination

ST Shows a finite state machine value representing the current state of the session

00 Reset

01 Pending BIND response

02 Session operating normally

03 Pending UNBIND response

04 Pending CINIT (Locating Destination LU)

MODE Specifies the SNA defined mode name as received in the BIND. Valid values are:

SNASVCMG Used for CNOS and management services sessions

CPSVCMG Used for CP-CP sessions

CPSVRMGR Used for DLUS/DLUR sessions

BATCH Used for 3174 dependent LU sessions

USER The user-specified mode name used for this session

Partner LU Specifies the name of the logical unit in session with the 3174 control point

Chapter 2. 3174 Peer Communication with APPN

The 3174 Peer Communication LIC feature, together with 3174 Configuration Support-C LIC microcode, provides a LAN segment for intelligent workstations (IWs) connected to an IBM 3174 Establishment Controller with a 3270 coax connection card. This allows IBM customers to easily migrate to a LAN environment while keeping their current 3270 wiring scheme.

Peer Communication is supported on a 3174 acting as a gateway, a Downstream Physical Unit (DSPU), or an APPN node logically attached to a token ring.

This feature, previously available as a chargeable RPQ 8Q0718 for Configuration Support-B Release 3 and 4, and an optional, no charge feature for 3174 Establishment Controller Configuration Support-C Release 3 and 4 Licensed Internal Code (LIC) is now shipped as standard on the 3174 Establishment Controller Configuration Support-C Release 5 control extension diskette, with no code merge required.

This feature does not provide any APPN functions. By providing a bridge function, the Peer Communication attached workstations can fully participate in APPN networking as APPN low entry network (LEN) nodes, APPN end nodes (ENs), or APPN network nodes (NNs) just as they would if directly attached to a token ring.

Coax-to-Ethernet Bridging Limitation

At the time of this publication, coax-to-Ethernet bridging was not supported when using 3174 Configuration Support-C and the 3174 Ethernet adapter. This means that APPN node-to-node communications can only exist between devices attached to the peer segment (coax-to-coax).

2.1 Peer Workstation Requirements

The 3174 Peer Communication LIC feature originally only worked in conjunction with the 3174 Workstation Peer Communication Support Program (WPCSP) PRPQ P85114 installed in the coax-attached DOS workstations. WPCSP provided a set of device drivers for the coax-attached workstations. These device drivers perform functions similar to those provided by the LAN Support Program device drivers used in token-ring networks.

Together, these two products allow coax-attached workstations to form a LAN. These LAN workstations can then communicate with other workstations attached to the same 3174, or to other workstations that are attached to the 3174 by an external token-ring network.

IBM provides a 3174 NDIS MAC drivers, at no charge, for DOS and OS/2 workstations. These drivers allow customers to use their coax-attached intelligent workstations (with 3270 emulator cards) to access LAN applications that run on the NDIS interface. The 3174 Peer Communications NDIS drivers are NDIS V2.01 compliant MAC drivers.

2.2 DOS Support

In a DOS environment you are provided with device drivers for the non-NDIS and NDIS interface. We focus on the NDIS device drivers, since the non-NDIS device drivers provided with the 3174 Workstation Peer Communication Support Program (3174-WPCSP) RPQ P85114 have been replaced by the NDIS drivers (IBMXLN), and are covered in the predecessor document *3174 APPN Implementation Guide*, GG24-3702.

The 3174 Peer Communications NDIS driver for DOS replaces the 3174 Workstation Peer Communication Support Program (3174-WPCSP) RPQ P85114. The NDIS driver may be used with applications such as TCP/IP for DOS Version 2.1, which requires NDIS compliant drivers.

The 3174 Peer Communications NDIS driver may also be used in conjunction with LAN Support Program (LSP) V1.33 or later. When used with IBM LAN Support Program Version 1.33, the 3174 Peer Communications NDIS driver may be used with LAN applications which require an IEEE 802.2 LLC interface, or a NetBIOS interface. The following are examples of applications that will function with this driver and IBM LAN Support Program Version 1.33:

- IBM's DOS LAN Requester
- Novell NetWare (using LANSUP.COM)
- Personal Communications/3270 Version 2.0 or later (PC/3270)
- TCP/IP for DOS Version 1.2
- NS/DOS
- AS/400 PC Support

10.2 KB of memory is required for the 3174 Peer Communications NDIS driver. Additional memory is required for DOS, the LAN Support Program, other device drivers and application programs.

IBM PC DOS V3.3 or later is the required level of operating system.

2.2.1 Configuring NDIS for DOS

When using the IBMXLN.DOS file with the LAN Support Program, you should use the DXMAID utility for installation. The IBMXLN.NIF file is also required for this installation. Answer Yes for the adapter options diskette question and supply the path to the IBMXLN.* files.

Also, if a locally administered address (LAA) is assigned when using IBMXLN.DOS, the LAA should be on the device driver line and not on the 802.2 line in the PROTOCOL.INI file.

Note: The IBMXLN.NIF file is an IBM format NIF file and is not readable by non-IBM applications.

In a DOS environment, IBM LAN Support Program Version 1.33 (or later) is required. In the examples shown in Figure 23 on page 59 and Figure 24 on page 59, we use both the NDIS protocol drivers provided with IBM TCP/IP for DOS and Windows Version 2.1 and the IBM LAN Support Program Version 1.33. The 3174 Peer Communications (LAN over coax) NDIS driver (IBMXLN.DOS) is not provided with IBM TCP/IP for DOS and Windows Version 2.1 or IBM LAN Support Program Version 1.33. It has been placed in the D:\TCPDOS21\BIN\IBMXLN.DOS subdirectory for this example.

```

REM *-----*
REM *   IBMXLN NDIS DRIVER SUPPORT   *
REM *-----*
DEVICE=C:\DOS52\SETVER.EXE
DEVICE=C:\WIN31\HIMEM.SYS
REM DOS=HIGH
FILES=30
BUFFERS=40
DEVICE=C:\WIN31\SMARTDRV.EXE /DOUBLE_BUFFER
STACKS=9,256
REM DEVICE = C:\DOS52\ANSI.SYS
DEVICE = D:\TCPDOS21\BIN\PROTMAN.DOS /I D:\TCPDOS21\ETC
DEVICE = D:\TCPDOS21\BIN\IBMXLN.DOS
DEVICE = D:\TCPDOS21\BIN\DOSTCP.SYS
DEVICE=\LSP133\DXMAOMOD.SYS 001
DEVICE=\LSP133\DXMEOMOD.SYS
DEVICE=\LSP133\DXMTOMOD.SYS 0=N ES=2 EST=3
DEVICE = C:\DOS52\ANSI.SYS

```

Figure 23. Sample CONFIG.SYS

```

;----- Protocol Manager Definition -----
[PROTMAN_MOD]
    DriverName = PROTMAN$

;----- Protocol Driver Definition -----
;IBM TCP/IP V2.1 for DOS

[TCPIP_V21]
    DriverName = DOSNDIS$

;--- Bindings Statement ---
    Bindings = IBMXLN,,,

;----- IBM LAN Support Program V1.3 -----

[DXMEQ_MOD]
    DriverName = DXMEOS
    Bindings = IBMXLN
[DXMTQ_MOD]
    DriverName = DXMTOS
    Bindings = IBMXLN

;----- IBM 3174 Peer Support -----

[IBMXLN]
; IBM 3174 PEER SUPPORT
; IBMXLN.DOS
    DriverName = IBMXLN$
    Maxtransmits = 6
    NETADDRESS = "400031744992"
    Maxtransmits = 6

;**** END OF FILE ****

```

Figure 24. Sample PROTOCOL.INI

2.2.2 Packaging

The 3174 Peer Communications NDIS device drivers for DOS consist of the following files:

- IBMXLN.DOS - The 3174 Peer Communications NDIS driver
- IBMXLN.NIF - The network information file (NIF)

2.2.3 Memory Considerations

The IBMXLN.DOS device driver uses approximately 10.2 KB of memory. However, the driver may be loaded into high memory using the DEVICEHIGH statement in CONFIG.SYS.

2.2.4 Compatibility with Novell NetWare

The 3174 Peer Communications NDIS Driver for DOS is compatible with the NetWare Client Kit for DOS/WINDOWS Version 1.01 (formerly known as NetWare Workstation Kit for DOS/Windows). The LANSUP.COM driver provided by NetWare Client Kit for DOS/WINDOWS V1.01 allows the Novell client to communicate through the 802.2 interface provided by IBM LAN Support Program Version 1.33. For best performance, it is also suggested that the burst mode support provided by NetWare Client Kit for DOS/WINDOWS Version 1.01 be used on both the Novell client and server.

All of this means that DOS APPC/APPN capable products can coexist on the same machine with a NetWare client.

2.3 OS/2 Support

The 3174 Peer Communications NDIS driver for OS/2 is currently provided as part of most IBM OS/2 communications software products. The 3174 Peer Communications NDIS driver for OS/2 is currently provided as part of the following OS/2 communications software packages:

- Extended Edition V1.3
- Extended Services V1.0
- Network Transport Services for OS/2
- TCP/IP for OS/2 V1.2.1

IBM OS/2 Version 1.3 or later is required.

2.3.1 Configuring NDIS for OS/2

For the OS/2, Peer Communications NDIS drivers were first made in the LAN Adapter and Protocol Support (LAPS) provided by IBM OS/2 Extended Edition Version 1.3. In the examples shown in Figure 25 on page 61 and Figure 26 on page 61, we have elected to use the LAPS provided with IBM Network Transport Services for OS/2.

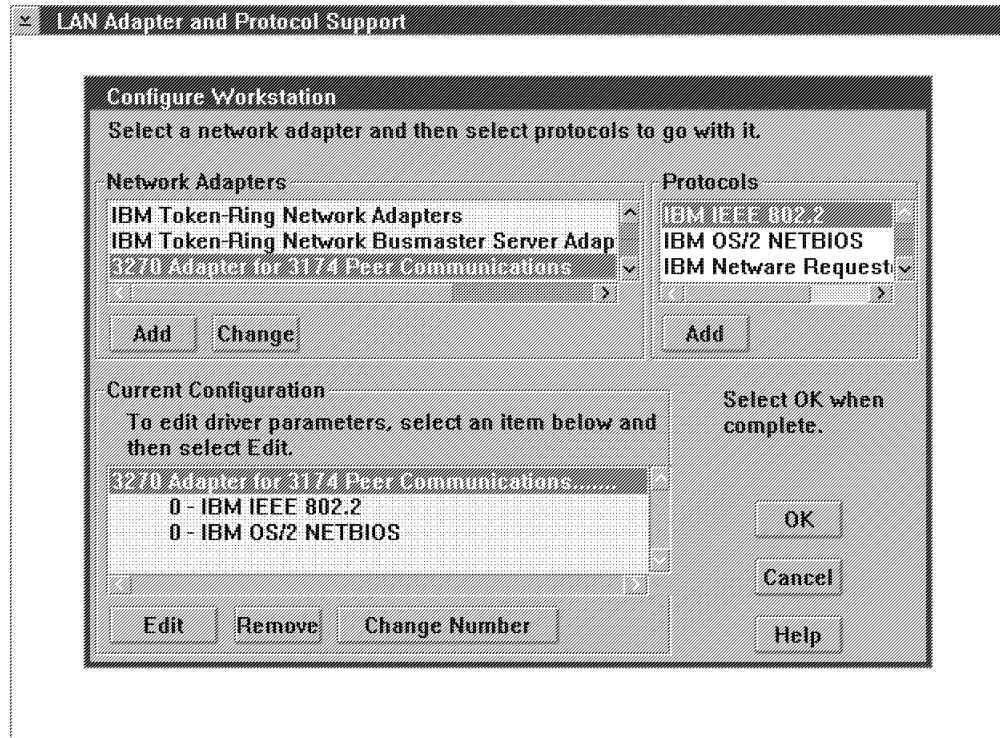


Figure 25. LAPS - Configure Workstation

On the Configure Workstation panel we selected the Configuration of:

- Network Adapters
 - 3270 Adapter for 3174 Peer Communications
- Protocols
 - IBM IEEE 802.2
 - IBM OS/2 NETBIOS

We then selected **Edit**, which presented us with the panel shown in Figure 26.

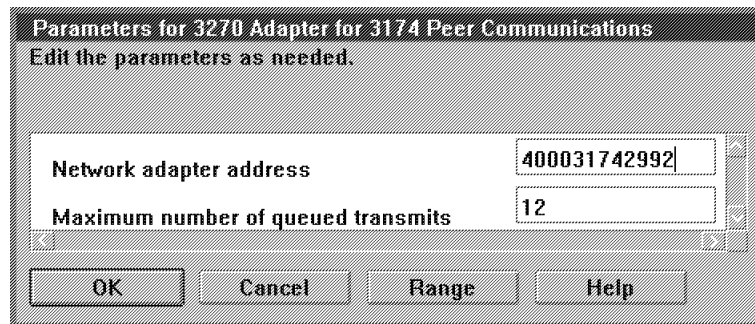


Figure 26. LAPS - Parameters for 3270 Adapter for 3174 Peer Communications

On the Parameters for 3270 Adapter for 3174 Peer Communications panel, we have entered a locally administered address (LAA) of 400031742992. This will override the port assigned addressing defined in the 3174 customization. See 2.7, "LAN Addressing" on page 64 for details on how LAN addressing is defined for 3174 Peer Communications.

2.3.2 Packaging

The 3174 Peer Communications NDIS device drivers for OS/2 consists of the following files:

- IBMXLN.OS2 - The 3174 Peer Communications NDIS driver
- IBMXLN.NIF - The network information file (NIF)

2.3.3 Compatibility with Novell NetWare

The 3174 Peer Communications NDIS driver for OS/2 works with the NetWare Client for OS/2 V2.01 (formerly known as NetWare Workstation Kit for OS/2 V1.3). The NetWare compatibility driver (ODI2NDI.OS2) provided by Network Transport Services for OS/2 converts the ODI protocol stack created by NetWare into an NDIS stack which is supported by the 3174 Peer Communications NDIS driver for OS/2.

This support does not have any APPN inference. It does provide the user with the ability to share a 3270 adapter between a NetWare client and an OS/2 APPC/APPN node when using 3174 Peer Communications.

2.4 Prerequisites

Each participating IWS must be equipped with:

- An IBM 3270 Connection Card or an IBM 3278/3279 Emulation Adapter (8K versions only).

Other 3270 emulation adapters that are *fully compatible* may work, but have not been tested. No support is offered or warranty implied for such adapters.

- Only one 3270 Adapter is supported in a workstation using the 3174 Peer Communications NDIS driver.
- The appropriate DOS or OS/2 Peer Communications device drivers.

3174 LIC Configuration Support-C up to, and including, Version 4

- Optional feature #8010 (Peer Communication) should be ordered for 3174 models 01L, 01R, 02R, 03R, 11L, 11R, 12L, 12R, 13R, 21L, 21R, 21H, 22L, 22R or 23R.
- Optional feature #8060 (Peer Communication) should be ordered for 3174 models 51R, 53R, 61R, 62R, or 63R.

3174 LIC Configuration Support-C5 or later (pre-merged)

For 3174 LIC Configuration Support B Release+4, RPQ 8Q0718 is required.

2.5 Physical Configuration

Figure 27 shows an example of the physical components in a 3174 Peer Communication configuration.

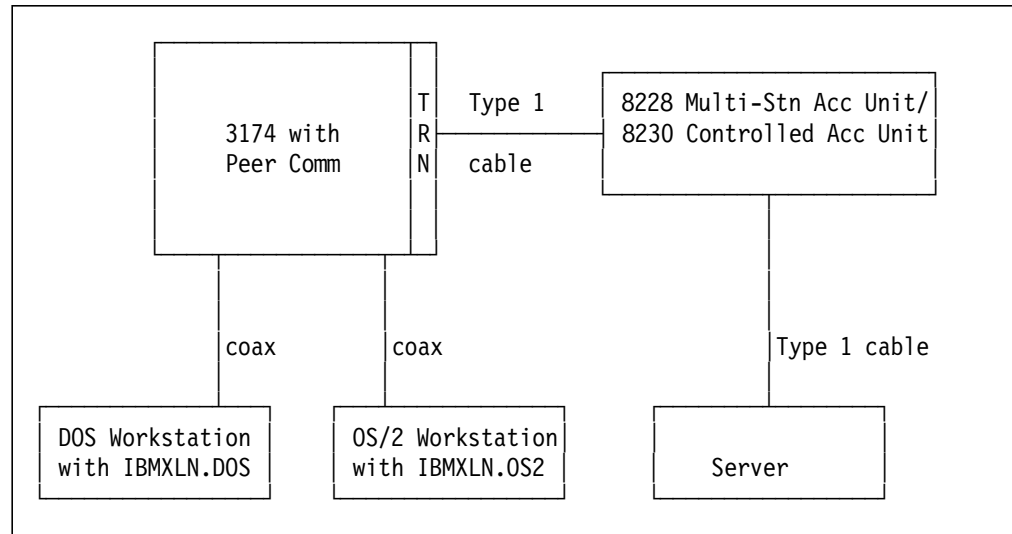


Figure 27. 3174 Peer Communication Function: Physical Configuration

2.6 Logical Configuration

Figure 28 shows the same configuration from a logical point of view. The Peer Communication feature simulates an internal token-ring network segment bridged through the 3174 token-ring adapter to a real external token-ring network segment.

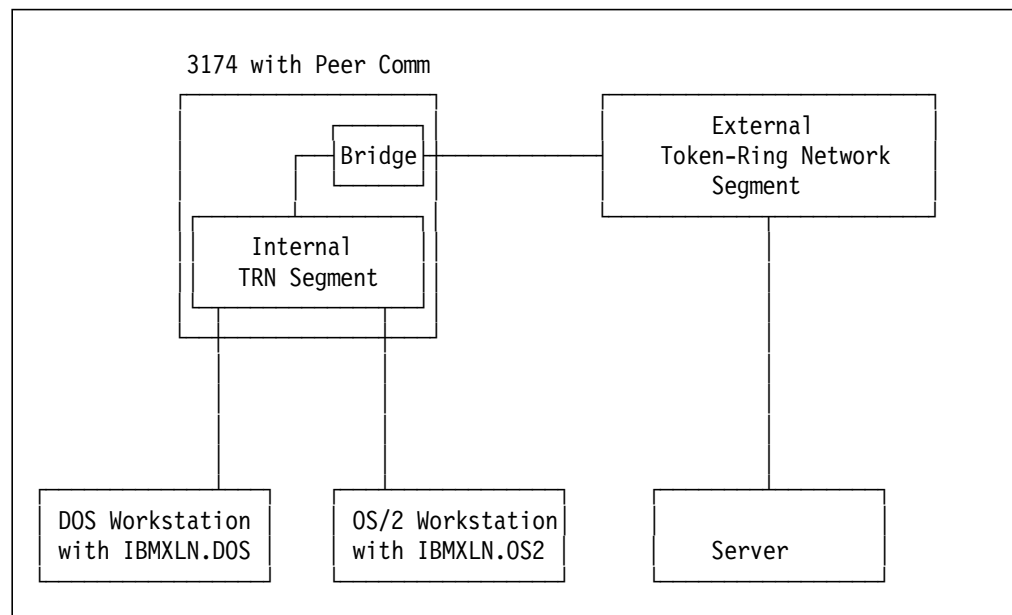


Figure 28. 3174 Peer Communication Function: Logical View

Note: For explanation purposes in this document, we have used either one of the following:

- *Internal token-ring network segment*
- *Internal token-ring*

This is because it is easier to visualize how one coax-attached workstation is connected to another coax-attached workstation. No token actually flows on this internal segment.

The official term used is *3174-Peer segment*.

We also used the term *external* or *real* token-ring network segment to refer to the token-ring network attached to the 3174 using the 8228 Multi-Station Access Unit or the 8230 Controlled Access Unit.

2.7 LAN Addressing

A MAC address can be specified during 3174 customization via Question 660 (see Section 3.12.5, "Question 660: 3174-Peer Port Address Range" on page 93). To form a standard 12-digit token-ring address, the first four digits are fixed as 4000. The 3174 automatically adds the last two digits using the port number. The MAC address is in the following format:

4000 XXXX XPN

In this case X is a user-definable portion of the address and PN is the port number automatically assigned by the 3174. Since a 3174 can handle 64 coax ports, 64 addresses are assigned to the internal token-ring.

For example, if you enter 317491 in Question 660, then the Peer workstation attached to port 0 will have an internal token-ring address of 400031749100 and the Peer workstation attached to port 63 will have an internal token-ring address of 400031749163. Notice that the last two digits relate to the port number.

You can override the address assigned through 3174 customization by specifying one address per operating system for each workstation via the LAN transport device driver you are using. This is equivalent to assigning a locally administered address (LAA) in a real token-ring environment. To remove problems caused by duplicate addressing, the specified address (LAA) must not be within the address range entered in Question 660. Using the previous example, you should not specify an address at the workstation within the range 400031749100 through 400031749163 inclusive. If the locally administered address (LAA) is within the range entered in Question 660, that workstation will not be able to join the internal token-ring when it is moved from one port to another.

Some applications used in the APPN network environment require you to specify the workstation address, thus tying the application to the address. If you use only 3174-assigned addressing (without overriding with a locally administered address) and you move the workstation to a different port on the 3174, you will have to change the address specified in the application to match the new port number.

Continuing with the previous example, and using only 3174-assigned addressing, a workstation on port 00 is moved to port 63. If the workstation was defined as a LEN node, you will have to change the address given for that workstation in the Network Resources panel from 400031749100 to 400031749163. Since EN and NN nodes can have multiple links over a single Transmission Group (TG), they are able to establish a separate link dynamically and with no regard to the information provided in the Network Resources panel. For an example of a Network Resources panel, see Figure 41 on page 82.

To avoid these changes and to provide port-independent addressing, we recommend that you specify a locally administered address for each peer-attached workstation. You should ensure that this specified address is not within the range of addresses specified by Question 660, and is not used elsewhere on the token-ring segments external to the 3174.

2.8 Bridge Function

In addition to providing a LAN environment for coax-attached intelligent workstations, the 3174 also acts as a *source routing bridge* between these IWSs and a *real* token ring LAN connected to the 3174. Both the internal and external token-rings are given segment numbers during 3174 customization. Participating workstations can communicate with each other or to any other workstation or LAN server that is connected to the token ring. This provides the workstations full LAN access without the additional expense of a token ring adapter.

Note

The bridge function is not available for 3174 Configuration Support-C Ethernet environments.

2.9 LAN Manager Support

It is possible to customize the 3174 to support LAN Network Manager functions. The LAN Network Manager must be V1.1 or higher.

A limited set of LAN management functions is available via online test menus. If the bridge function is enabled, LAN Manager support is *disabled*, and online test updates are allowed.

2.10 3174 APPN and Peer Communication Combined

When the 3174 APPN feature is used in conjunction with the Peer Communication feature, APPN nodes attached to a 3174 network node by coax can access the attached 3174 network node or any other APPN node on the external token-ring. Remember that this function is not available when the LAN is Ethernet and the 3174 is running 3174 Establishment Controller Configuration Support-C Release 4 or later.

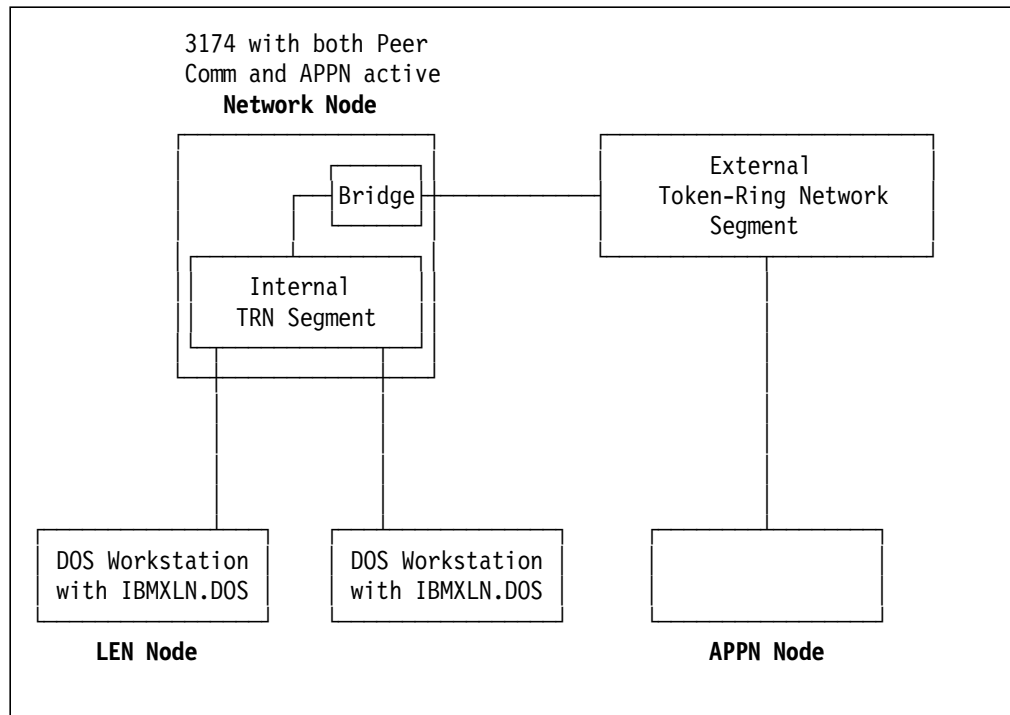


Figure 29. 3174 Combined APPN and Peer Communication Function: Logical View

Chapter 3. 3174 APPN and Peer Communication Customization

Customization is the process of tailoring the 3174 Configuration Support-C, Licensed Internal Code (LIC) to meet your unique requirements.

This chapter provides guidance on customizing the 3174 for APPN and Peer Communication functions. For a detailed description of each customizing Question, refer to *3174 Establishment Controller Planning Guide Configuration Support-C*, GA27-3918, or *3174 Establishment Controller Supplemental Customer Information for Configuration Support-C Release 4*, GA27-3994.

The following chapters in the planning guide are important:

- Planning for Common SNA
- Planning for APPN
- Planning for 3174 Peer Communication
- Appendix A: Configuration Worksheets

The following chapters in the supplement for Configuration Support-C4 are important:

- Chapter 3: Planning for Customization
- Appendix A: Customization Planning Worksheets

Figure 30 on page 68 shows the flow sequence of panels when customizing the 3174 for APPN and Peer Communications with:

- 3174 Establishment Controller Configuration Support-C Release 3
- 3174 Establishment Controller Configuration Support-C Release 4 without RPQ 8Q1041 (TCP Enhancements)
- 3174 Establishment Controller Configuration Support-C Release 5

Note: CS-C Release 5 does not support RPQ 8Q1041 (TCP Enhancements), but is included in CS-C Release 6.

The Technical Newsletter GN-3391-00 provides information for 3174 Configuration Support-C Release 6 enhancements: APPN support for ESCON channel connections, Source-route bridging and others.

This Technical Newsletter provides replacement pages for the *3174 Planning Guide*, GA27-3918-02.

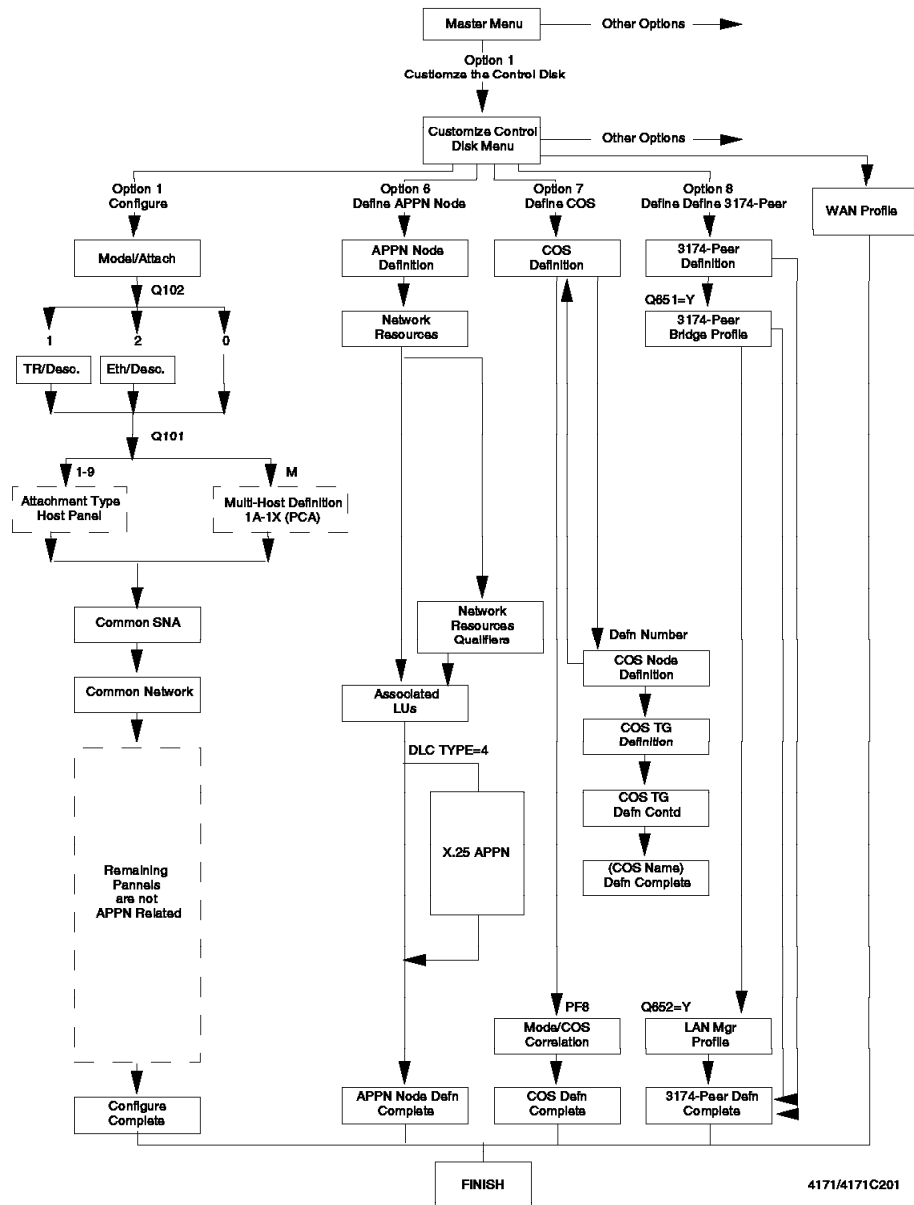


Figure 30. 3174 CS-C Customization Panel Flow Sequence

3.1 Master Menu

```

_____ Master Menu _____

(C) COPYRIGHT IBM CORP 1986, 1991 - ALL RIGHTS RESERVED
Licensed Internal Code - Property of IBM
Select Option; press ENTER

Option      Description

  1  1  Customize the Control Disk
  2      Merge DSL
  3      Copy Files
  4      Diagnostics
  5      Microcode Upgrade
  6      Central Site Customizing
  7      Media Management
  K      Identify Customizing Keyboard

Select ==> 1

```

Figure 31. 3174 Customizing Master Menu

- 1** To begin customizing the 3174, select option 1.

3.2 Customize Control Disk Menu

```

_____ Customize Control Disk Menu _____

Select Option; press ENTER
Option      Description

  1  1  Configure
  2      Define Devices
  3      Merge RPQs
  4      Modify Keyboards
  5      Define AEA
  6  2  Define APPN Node
  7  3  Define COS
  8  4  Define 3174-PEER
  9  5  Define WAN Profiles
Select ==>
Press PF12 to File, PF3 to Quit, or Select another Option
PF: 3=Quit  4=Default  7=Back  8=Fwd  9=Check  12=File

```

Figure 32. Customizing Options

- 1** Option 1 is used to customize the 3174 physical connections and base functions.
- 2** Option 6 is used to customize the APPN functions.
- 3** Option 7 is used to define COS tables and mode/COS correlations.
- 4** Option 8 is used to define the Peer Communication functions. In the following panels, the Peer Communication function is referred to as 3174-Peer support.
- 5** Option 9 became available in Configuration Support-C5. It is used to define the WAN profiles for X.25 links. See 3.14, “WAN Profiles” on page 99 for a detailed discussion of the profiles.

3.3 Model/Attach

```

_____ Model / Attach _____

098 _____
099 - 3174 11R ITS0 RALEIGH
100 - 11R
101 - 2

PF: 3=Quit 4=Default      8=Fwd

```

Figure 33. Model/Attach Panel for CS-C Release 3

```

_____ Model / Attach _____

Online Test Password  098 -
Product Assistance Data
099 - 3174 11R ITS0 RALEIGH
3174 Model           100 - xxx
Host Attachment       101 - x  (1-BSC           6-SDLC, X.21 Switched
                               2-SDLC           7-Token-Ring
                               3-X.25         8-Ethernet
                               4-Non-SNA Channel 9-Frame Relay 1
                               5-SNA Channel   M-Multi-host)

LAN adapter type      102 - 0  (0-none
                               1-Token-Ring
                               2-Ethernet)

NS0 selection         103 - 0000000000000000
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 34. Model/Attach Panel for Configuration Support-C Releases 4 and 5

1 Q101 9-Frame Relay does not appear on the Model/Attach panel prior to Configuration Support-C5.

3.3.1 Question 100: 3174 Model Designation

Question 100 has been expanded to include the selection of the following new Ethernet network server models:

Q100=14R Floor Unit

Q100=24R Rack Mount

Q100=64R Table Top

Using a 3174 Workstation Networking Module (WNM) and CS-C Release 5 or later, you can select two new models:

Q100=41R (similar functionality as 21R)

Q100=42R (similar functionality as 22R)

3.3.2 Question 101: Host Attachment

Configuration Support-C4 provides you with the ability to have an Ethernet link to the host. Question 101 has been expanded to include the selection of an Ethernet link to the host as either a single link single host or single-link multi-host (SLMH):

Q101=8 when Q100=14R, 24R, or 64R

Q101=M Single Link Multi Host

Configuration Support-C5 provides you with the ability to have a frame relay link to the host. Q101 has been expanded to allow the selection of a frame relay link as either a single link single host or SLMH:

Q101=9, when Q100=11R, 12R, 13R, 14R, 21R, 23R, 24R, 61R, or 62R

3.3.3 Question 102: LAN Adapter Type

Question 102 allows you to select the type of LAN adapter you want configured. This question has only two valid answers for Configuration Support-C4, 0 or 2 (none or Ethernet, respectively) because token-ring support is disabled. RPQ 8Q1041 (TCP Enhancements), based on Configuration Support-C4, enable you to select Token-Ring, Ethernet or none as the LAN adapter type.

Configuration Support-C5 is the first non-RPQ release to have full LAN (token-ring and Ethernet) support:

Q102=1 Token-Ring Configuration for Q101= x3R, 11R, 21R, 41R or 61R.

Q102=2 Ethernet for Q101= x4R, 11R, 21R or 61R

Q102=0 No LAN adapter in the 3174

3.3.4 Question 103: Non-Standard Operation Selection

Question 103, Non-Standard Operation (NSO) selection, appears on the Model/Attach panel for Configuration Support-C Release 4 and later. Usually you should let it default to 0000000000000000. Your customer support will advise you if any of the NSO bits are applicable.

Q103=0000000000000000 NSO Selection

3.4 Local (SNA)

Local (SNA)					LOCL
104 - 40	105 - 00	108 - 23N6233	110 - 1 0000	116 - 2 _ _	
121 - 01	123 - 0	125 - 00000000	126 - 00000000	127 - 2 4	
132 - 0 0 0 0	136 - 1 0 0 1	137 - 0 0 0 0	138 - 0		
141 - A	150 - 0 0	165 - 0	166 - A	168 - 0	
173 - 00000000	175 - 000000	179 - 0 0 0	190 - 00		
213 - 1	215 - 00000	220 - 3			
222 - 1	223 - 10	224 - 2	225 - 4		
240 - 0	241 - 0	242 - 1			

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 35. Local SNA Panel

Notes:

1. Q105 must be zero if Q102 is zero. See Figure 34 on page 70.
2. When TCP/IP (Q052) is configured, you must configure for a LAN adapter (Q102).

3.4.1 Question 242: Link Type

Question 242 applies only to a channel-attached 3174. The response indicates the type of traffic the channel link to the host is able to carry. Valid responses are:

- 0 = Only T2.0 traffic (default response)
- 1 = Combined T2.0 and T2.1 traffic

If you require an APPN connection to a subarea network host, you must respond to Question 242 with a 1. This will then allow the link to the host to be shared by both the T2.0 and T2.1 traffic.

If you respond to Question 242 with a 1, you must enable the 3174 APPN functions by responding to Question 510 (APPN Network Controller) with a 1.

3.5 SDLC

SDLC

104 - C0	105 - C3	108 - 00000000	110 -	
121 - 01	123 - 0	125 - 00000000	126 - 00000000	127 - 0 0
132 - 0 0 0 0	136 - 1 0 0 1	137 - 0 0 0 0	138 - 0	
141 - A	150 - 1 0	165 - 1	166 - A	168 - 0
173 - 00000000	175 -	179 - 0 0 0	190 - 00	
213 - 1	215 - 00000	220 - 0		
310 - 0	313 - 1	317 - 0	318 - 0	340 - 1
365 - 0	370 - 1			

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 36. SDLC Panel

3.5.1.1 Question 370: Maximum Inbound I-Frame Size

This question applies to an SDLC-attached 3174. Valid responses are:

0=265-byte maximum I-frame (default response)

1=521-byte maximum I-frame.

When APPN is enabled for connection to an NCP, the response must be 1. This is because LU 6.2 Binds may exceed 256 bytes and NCP does not provide reassembly of Binds.

Note: Using Configuration Support-C5 or later, higher speed WAN communications (up to 256 Kbps) are supported for X.21 and V.35 for SDLC communications for some configurations.

3.6 X.25

```

_____ X.25 _____

104 - C1 1 108 - 0000000 110 - 0 0001 116 - 1_ __
121 - 01 123 - 0 125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0 138 - 0
141 - A 165 - 1 166 - A 168 - 0
172 - 0 173 - 00000000 175 - 179 - 0 0 0
213 - 1 215 - 31745 220 - 0 365 - 0
370 - 0 372 - 1 0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 37. Defining the X.25 Connection

1 This is the X.25 secondary station address. When connecting to VTAM APPN or VTAM LEN nodes on SDLC or channel links, the 3174 is always the secondary station. This is not negotiable.

At the time of writing, the 3174 does not support both APPN and gateway functions concurrently with Configuration Support-C6. The RPQ 8Q0743 written for Configuration Support-C3 is required for gateway support. This RPQ is also available for Configuration Support-C5.

3.7 Frame Relay

```

_____ Frame Relay _____

1 090- 0500 04 108 - 3174002 110 - 0 0001 116 - 1_ __
121 - 01 123 - 0 125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0 138 - 0
141 - A 2 150 - 1 165 - 1 166 - A 168 - 0
172 - 0 173 - 00000000 175 - 179 - 0 0 0
213 - 1 3 215 - 31742 220 - 0
250- 03 251 - 030 252 - 07 253 - 002
260 - 2 261 - 2

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 38. Defining the Frame Relay Connection

- 1** The four-digit decimal DLCI number and SAP.
- 2** There is only one option for gateway communications when using frame relay that determines whether the controller acts as a LAN gateway or not.
- 3** A frame relay connection is switched from the VTAM's point of view so the PUID here should correspond to the IDNUM parameter in the VTAM PU switched major node for the 3174.

3.8 Common SNA

The Common SNA panel is an important panel for APPN customization. The Common SNA panel allows you to:

- Give a name to identify the network for the 3174 you are customizing (Q501)
- Give a name to the control point for the 3174 (Q511)
- Give a name to the connection network (Q512)
- Enable the 3174 APPN functions (Q510)

Other responses on this panel are:

- Question 500: CSCM Unique
- Question 502: Logical Unit Name

These questions are for Central Site Change Management (CSCM) functions. The LU named in Question 502 is a dependent or an independent LU, depending upon whether APPN is enabled and LU naming is different or the same as the CPNAME.

The LU for CSCM is a dependent LU if APPN is not enabled (Question 510=0). It is also a dependent LU if APPN is enabled (Question 510=1) but the LUNAME (Question 502) and CPNAME (Question 511) are not the same. In both cases, the host CSCM LU definition should specify LOCADDR=1.

The LU for CSCM is an independent LU only if APPN is enabled and the LUNAME is the same as the CPNAME. Here, the host CSCM LU definition should specify LOCADDR=0. For NetView DM/2 requires independent LU support for 3174 CSCM.

The screenshot shows the 'Common SNA' panel with the following fields and options:

- Top right: 40/LOCL
- Fields:
 - 500 - 0
 - 501 - USIBMRA_
 - 502 - _____
 - APPN Support Fields:
 - 510 - 1
 - 511 - CP3174__
 - 512 - CNET____
- Bottom row of options: PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH

Figure 39. Common SNA Panel

3.8.1 Question 501: Network ID(NETID)

The response is the name used to identify the network that the 3174 you are customizing is attached to. A network ID is required if you are using either of the following:

- CSCM (Question 500=1 or 2)
- APPN (Question 510=1)

The following rules apply to the network ID when APPN is enabled:

- It must not be the same as:
 - The control point name given in Question 511
 - The virtual node name given in Question 512
 - Any CPNAME on the Network Resources panel
 - Any CPNAME, LUNAME or SERVING NN name on the Associated LUs panel
- It may be up to eight alphanumeric characters long. The first character must be a letter, and there are no blanks or spaces allowed between characters.

3.8.2 Question 510: APPN Network Controller

The response indicates whether APPN functions in the 3174 are enabled. Valid responses are:

0 = APPN not enabled (default response)

1 = APPN enabled

If you enable the 3174 APPN functions (Question 510=1), then:

- The link type for a channel-attached 3174 must be able to carry both T2.0 and T2.1 traffic (Question 242=1).
- The network ID (Question 501), the control point name (Question 511) and the virtual node name (Question 512) must be unique.

If you enable the 3174 APPN functions and perform no further APPN customization, you will get a minimum APPN configuration using the IBM-supplied class of service definitions.

3.8.3 Question 511: APPN Control Point Name (CPNAME)

The response is used as the control point name and identifies the 3174 network node to the network.

The following rules apply to the control point name:

- It is required when APPN is enabled.
- It must not be the same as:
 - The network ID given in Question 501
 - The virtual node name given in Question 512
 - Any other resource name in the network
- It may be up to eight alphanumeric characters long. The first character must be a letter with no blanks or spaces allowed between characters.

The name specified should be obtained from or coordinated with the person(s) responsible for the network.

3.8.4 Question 512: APPN Virtual Node Name (VNODE)

A connection network is used to minimize definitions for nodes connected to a shared access transport facility such as a LAN (token-ring or Ethernet) network. Physically, the connection network is the LAN (token-ring or Ethernet) network to which the 3174 network node is attached.

Question 512 allows you to give a name to a connection network so that all nodes using the same connection network can point to the same name.

The connection network name is also called:

- The virtual node name in the 3174
- The connection network control point name (CNNCPNAME) in the AS/400
- The connection network name in NS/2

It is used fully qualified by the network ID.

The following rules apply to the connection network (or virtual node) name:

- It is required when Question 510=1 (APPN enabled) and the 3174 has been customized for LAN (token-ring and Ethernet) adapter (Q102 = 1 or 2) connections, even if a connection network is not used.
Configuration Support-C5 removed the need for an LAN (token-ring and Ethernet) connection when Question 510=1 (APPN enabled).
- It must not be the same as:
 - The network ID given in Question 501
 - The control point name given in Question 511
 - Any CPNAME on the Network Resources panel
 - Any CPNAME, LUNAME or SERVING NN name on the Associated LUS panel
 - Any other resource name in the network
- It may be up to eight alphanumeric characters long. The first character must be a letter with no blanks or spaces allowed between characters.

The name specified should be obtained from or coordinated with the host system programmer.

3.9 APPN Node Definition

Select Option 6, Define APPN Node, in the Customize Control Disk Menu, to customize the APPN functions.

The APPN Node Definition panel allows you to specify the capabilities of the 3174 network node:

- Question 610: APPN Sessions
- Question 611: APPN Nodes/Links
- Question 612: APPN Wildcard Option
- Question 613: APPN Wildcard Host Link

_____ APPN Node Definition _____

610 SESSIONS - 1 611 NODES/LINKS - 1

612 WILDCARD - 1 613 HOST LINK - 1A

1 Alert Focal Point(614-615)
614 FP NAME - _____ 615 FP NETID - _____

2 Report to Alert Focal Point(616)
616 HOST LINKS - _ _ _ _ _

3 DLUS Primary Host Name(620-621)
620 CPNAME - _____ 621 NETID - _____

4 DLUS Backup Host Name(622-623)
622 CPNAME - _____ 623 NETID - _____

PF: 3=Quit 4=Default 8=Fwd

Figure 40. APPN Node Definition Panel

1 through **4** are options introduced in Configuration Support-C5 to support LU 6.2 Management Services and DLUR.

3.9.1 Question 610: APPN Sessions

The response indicates the number of LU 6.2 intermediate sessions that may be started through the 3174. Valid responses are:

<i>Table 7. APPN Sessions Using Question 610</i>	
Q610	Number of Sessions supported
1	up to 225 sessions (default response)
2	up to 500 sessions
3	up to 750 sessions
4	up to 1000 sessions

Your response is used to:

- Allocate control storage when the 3174 network node is initially loaded. Since APPN sessions are dynamically set up, depending upon resources (buffers, control blocks, links) available at session initiation, this value may not always be achieved.
- Determine the total amount of storage required for the 3174.

The number of APPN sessions customized affects the amount of control storage required, as shown in 4.1.2, “APPN Storage Requirements” on page 101.

Every LU6.2 session between a LEN or EN and another LEN or EN counts as one session. Every parallel session has a management session which also counts as a session.

3.9.2 Question 611: APPN Nodes/Links

The response indicates the number of T2.1 links (LAN, X.25 and frame relay) to adjacent nodes that are supported by the 3174 network node and the size of the topology database. Valid responses are:

<i>Table 8. Nodes and Links Specified Using Question 611</i>		
Q611	Number of Nodes/Links Supported	Topology Database Size
1	up to 20 nodes/links (default response)	149 nodes
2	up to 75 nodes/links	149 nodes
3	up to 150 nodes/links	293 nodes
4	up to 225 nodes/links	293 nodes

Your response is used to:

- Allocate control storage when the 3174 network node is initially loaded. Since T2.1 links are dynamically activated as required, dependent upon resources (control blocks and ports) available at link establishment, this value may not always be achieved.
- Determine the total amount of storage required for the 3174.

The number of nodes/links customized affects the amount of control storage required, as shown in 4.1.2, “APPN Storage Requirements” on page 101.

3.9.3 Question 612: APPN Wildcard Option

The response indicates whether the 3174 network node you are customizing holds the wildcard connection to the host on behalf of the APPN network. Valid responses are:

0 = No (default response)

1 = Yes

The wildcard option allows LUs to be dynamically located in a subarea network. The wildcard option permits sessions to be established from LUs in the APPN network to LUs in or through a subarea network. Specifying YES does not guarantee that the desired destination LU is in the host. However, if the destination LU is in the host or if the host knows where the destination LU is located, the session will be established.

When using wildcards, the following should be noted:

- The APPN cannot guarantee selection of the appropriate link when there are multiple links into a subarea network. Therefore, the APPN network must have only one link into the subarea network.
- Only one network node in an APPN network may have the full wildcard option active.
- The 3174 network node implements a full wildcard when this option is selected. Partial wildcard is achieved via the generic naming capabilities in Configuration Support-C Release 3 and later.
- AS/400 refers to its full wildcard option as generic routing with *ANY as a location name.
- NS/2 allows you to specify a full wildcard option as a WILDCARD_ENTRY(FULL) parameter in the DEFINE_PARTNER_LU_LOCATION statement.

3.9.4 Question 613: APPN Wildcard Host Link

The response indicates which host link to this 3174 APPN Network Node will be used for wildcard routing. Valid responses are:

1A = Host link 1A is used for wildcard routing

1B = Host link 1B is used for wildcard routing

1C = Host link 1C is used for wildcard routing

1D = Host link 1D is used for wildcard routing

1E = Host link 1E is used for wildcard routing

1F = Host link 1F is used for wildcard routing

1G = Host link 1G is used for wildcard routing

1H = Host link 1H is used for wildcard routing

For additional information, refer to 1.4.3.1, "Wildcard Routing" on page 18.

3.9.5 Question 614: Alert Focal Point

The response indicates the focal point to which the 3174 NN will report network management alert information for itself and any served ENs. The focal point name is the CPNAME if the focal point is CM/2, AS/400 or NetView V2R4 using VTAM V4R1 or higher. For earlier releases of VTAM, the NetView LUNAME is used.

3.9.6 Question 615: Alert Focal Point Network ID

This question is optional and identifies the network ID for the APPN focal point for the 3174. If Q614 is left blank, this question is ignored. If this question is left blank and Q614 is answered, this question defaults to the network ID of the 3174 NN.

3.9.7 Question 616: Alert Focal Point (Host Links)

This question is optional and indicates the host links for dependent LUs whose alerts are sent to the APPN focal point. If left blank, the only alerts sent to the focal point are those from the served ENs and those that pertain to the 3174 PU. Valid responses are similar to Q613.

3.9.8 Question 620: Dependent LU Server (DLUS) Primary Host Name

This question indicates the CPNAME of the primary DLUS with which the 3174 DLUR will provide support for local dependent LUs. DLUS is available only VTAM V4.2.

3.9.9 Question 621: Dependent LU Server (DLUS) Primary Host Network ID

This question identifies the subnetwork where the primary DLUS host resides. If Q620 is left blank, this question is ignored. This defaults to the network ID of the 3174 if left blank and Q620 is answered.

3.9.10 Question 622: Dependent LU Server (DLUS) Backup Host Name

This question identifies the name of the backup DLUS with which the 3174 DLUR will provide support for dependent LUs if there is no response from the primary DLUS.

3.9.11 Question 623: Dependent LU Server (DLUS) Backup Host Network ID

This question identifies the subnetwork where the backup DLUS host resides. If Q622 is left blank, this question is ignored. This defaults to the network ID of the 3174 if left blank and Q622 is answered.

Note: We recommend that the DLUS server name be configured if the 3174 DLUR is not adjacent to the DLUS host. The 3174 will initiate the pipe, thus keeping an adjacent SSCP from attempting to activate a 3174 without a DLUR-DLUS session.

3.10 Network Resources Definition

The Network Resources and Associated LUs panels allow you to define nodes in the APPN network to the 3174 network node you are customizing. You may use these panels to define:

- LEN nodes for which the 3174 is acting as a server.
- LUs that are located in the LEN nodes served by the 3174.
- Network nodes that are adjacent to the 3174 that require CP-CP sessions.
- Nodes that share a link for both Type 2.0 and 2.1 traffic, such as a 3174-13R that is used for both 3270 DSPU and APPN functions. This shared link can be dynamic if the node address appears in the 3174 gateway customization as a DSPU.
- Addresses of nodes to which the 3174 network node will initiate a connection when it is IMLed.
- Resources that are to be preloaded in the 3174 directory cache to reduce the number of broadcasts in the network.
- DLUS.

Network Resources							001	of 240
	CPNAME	NODE TYPE (1-4)	LUS* (X)	DLC TYPE (1-5)	ADDRESS**			DLCI
	1	2	3	4	5	6		7
1	PSNSNN1_	3	-	1	4000 3001 0031	04		
2	PSNSEN1_	2	-	1	4000 3001 0047	04		
3	PSLEN1_	1	X	1	4000 3001 0041	04		
4	RALYAS4B	3	-	1	4000 1002 0002	04		
5	RALYAS4A	3	-	1	4000 1002 0001	04		
6	PSCOAX1A	1	X	1	4000 3001 9119	04		
7	PSCOAX1B	1	X	1	4000 3001 9117	04		
8	PSCOAX1C	1	X	1	4000 3001 9118	04		
9	RAP	4	-	1	4000 0011 0002	04		
11	RAI	3	-	5				0500 04
11	CP31745_	3	-	5				0505 04
12	RAK	3	-	5				0501 04

* - Enter 'X' to define Associated LUs where required.

PF: 3=Quit 4=Default 7=Back 8=Fwd 10=PageBk 11=PageFwd

Figure 41. Links to Adjacent Nodes

1 CPNAME is the name of the network node, end node or LEN node you are defining. Each CPNAME must be unique. The top right-hand corner of the panel shows that the entries are numbered from 001 to 240. The maximum number of CPNAMEs you may define is limited by your response to Question 611: APPN Nodes/Links. For example, if Question 611=4 (up to 225 nodes/links), then only 225 CPNAMEs can be defined.

2 NODE TYPE specifies the type of APPN node. Valid responses are:

- 1 = LEN node
- 2 = End node
- 3 = Network node
- 4 = LEN-SSCP

The 3174 supports a maximum of eight adjacent network nodes. That is, you can have a maximum of eight entries with a NODE TYPE of 3.

3 If you wish to specify LUs associated with a network node, end node, or LEN node, enter an X in the LUs field for that node. You may enter an X for a maximum of 120 nodes.

Whether to specify associated LUs for a node depends on the node type:

- A LEN node does not have CP-CP session capability with a network node server. Hence, there is not a CP-CP session for the LEN node to send its local LU names to the network node server. The network node server cannot automatically register LU names of the adjacent LEN node, nor can it search the LEN node for requested LUs. You should therefore specify associated LUs for each LEN node so that the network node server can respond to search requests for these LUs.

You may specify a maximum of four associated LU names in the Associated LUs panel for each node marked with an X. Therefore, a maximum total of 480 (4 x 120) associated LUs can be specified in a 3174 network node.

- You need not specify associated LUs for an end node using this 3174 network node as its server. The end node is able to register its LUs with the network node server.

4 DLC TYPE is the data link control type. The valid responses are:

- 1=LAN (token-ring or Ethernet)
- 2=SDLC
- 3=S/370 Channel
- 4=X.25
- 5=Frame Relay
- 6=ESCON

Options 4 and 5 became available in Configuration Support-C5. Option 6 became available in Configuration Support-C6.

Note: The response 1 is used whether a node is attached to an IBM Token-Ring network, Ethernet network, or by coax to a 3174 using the Peer Communication feature. Remember that 3174 Peer-attached devices are unable to communicate with Ethernet-attached devices, because currently the 3174 does not support Peer to Ethernet bridging.

5 The ADDRESS field specifies the LAN address for establishing a link connection. If DLC TYPE=1 (LAN), this ADDRESS field is required. For SDLC (DLC TYPE=2), S/370 Channel (DLC TYPE=3), X.25 (DLC TYPE=4), frame relay (DLC TYPE=5), and ESCON (DLC TYPE=6) attachments, leave this field blank. This is the 12-character hexadecimal LAN address of the node.

6 The last two characters of the ADDRESS field are the SAP. The valid range is from X'04' to X'E8', in multiples of four.

7 The DLCI field specifies the DLCI and SAP used to identify frame relay connections. This is required if DLC TYPE=5 is specified and should be left blank for other types of attachment.

In the example shown in Figure 41 on page 82, the following have been defined:

- One PS/2 NS/2 network node: PSNSNN1
- One PS/2 NS/2 end node: PSNSEN1
- One PS/2 LEN node: PSLEN1
- Two AS/400 network nodes: RALYAS4A and RALYAS4B
- Three LEN nodes attached via 3174 Peer Communication: PSCOAX1A, PSCOAX1B and PSCOAX1C
- One LEN/Subarea: RAP
- Three NN nodes attached via frame relay: RAI, CP31745 and RAK

3.10.1 Network Resources Qualifier

Network Resources Qualifiers				001 of 004 NN
CPNAME	NETID	PUNAME 1		
_____	_____	_____		-
_____	_____	_____		-
_____	_____	_____		-
_____	_____	_____		-
_____	_____	_____		-
_____	_____	_____		-
_____	_____	_____		-

PF: 3=Quit 4=Default 7=Back 8=Fwd 10=PageBk 11=PageFwd

Figure 42. Qualifying the Network Resources for LEN-SSCP Connections

The Network Resources Qualifier panel is displayed only if one of the nodes on preceding Network Resources panel has been defined with a node type of 4 (LEN-SSCP). This panel gives you an opportunity to add a certain degree of security to your network for SSCP takeover.

1 The PUNAME is the PUNAME of the NCP that the LEN-SSCP owns.

3.10.2 Associated LUs

Associated LUs						001 of 004 SERVING NN
CPNAME 7	LUNAME 8	LUNAME	LUNAME	LUNAME		9
1 PSLEN1	PSLEN1	_____	_____	_____		CP3174
2 PSCOAX1A	PSCOAX1A	_____	_____	_____		CP3174
3 PSCOAX1B	PSCOAX1B	_____	_____	_____		CP3174
4 PSCOAX1C	PSCOAX1C	_____	_____	_____		CP3174

PF: 3=Quit 4=Default 7=Back 8=Fwd 10=PageBk 11=PageFwd

Figure 43. Defining LUs to the 3174 Directory

The Associated LUs panel is displayed if an X has been entered in the LUs field for a node on the Network Resources panel.

7 CPNAME is the name of the node with associated LUs selected on the Network Resources panel. It is automatically filled in and cannot be modified.

8 LUNAME is the name of the logical unit associated with the node.

9 SERVING NN is the name of the network node server for the node. Note the following:

- If CPNAME is the name of a network node, then this field must either be left blank or be the same as CPNAME. If left blank, the default is the CPNAME of the NN. A network node must be its own server; this logic ensures that it will be its own server.
- If CPNAME is the name of an end node or LEN node, then this field may be left blank or filled in.

If you want the 3174 you are customizing to be the server, then do either of the following:

- Leave it blank. The default assumes the name given in Question 511.
- Enter the name given in Question 511.

If you want another network node to be the server, then enter the name of that network node. It can be any network node in the APPN network but you have to ensure that it is a network node and not an end node or a LEN node. The 3174 you are customizing will not be able to find this for you.

3.10.3 X.25 APPN Nodes

The X.25 APPN Nodes panel is used to define X.25 subscriber parameters to adjacent X.25 APPN nodes.

X.25 APPN Nodes				
1	2	3	4	5
CPNAME	PROFILE	CONNECTION ID	LCN	DTE ADDR
1 RALYAS4B	01			201001209
2 RAI	1A			101100201

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

Figure 44. X.25 APPN Nodes

The X.25 APPN Nodes panel will appear if a DLC TYPE of 4 is specified for a node defined on the Network Resources panel.

1 This is the CPNAME of nodes with a DLC type of X.25 (DLC TYPE=4).

2 This is the ID of the X.25 circuit profile either defined in the X.25 WAN Profiles or the Host link ID.

3 This is the Connection ID to be verified for the adjacent node.

4 This is the Logical Channel Number (LCN) specified for a PVC when the 3174 is to initiate the connection.

5 If the link is SVC and you want the 3174 to initiate the connection, write the DTE address in the DTE ADDR field.

3.11 COS Definition

Whether you need to select **Define COS** on the Customize Control Disk Menu panel, depends on your network and the session(s) mode you require. IBM supplies default COS tables that can be used as is, or manipulated during 3174 customization.

3.11.1 IBM-Supplied COS Tables

When you enable APPN functions in the 3174, seven IBM-supplied COS tables are automatically available. These tables have the following COS names and uses:

- **#BATCH**

This COS name maps to a mode named #BATCH. It is a general, batch-oriented COS that uses low transmission priority. It is used when high capacity and low cost are more important considerations than rapid response.

- **#BATCHSC**

This COS name maps to a mode named #BATCHSC. It has the same characteristics as #BATCH except that it provides at least a security level of 1 or, put another way, a security level that is not 0.

- **#INTER**

This COS name maps to a mode named #INTER. It is a general, interactive COS that uses high transmission priority. It is used when rapid response is a more important consideration than high capacity and low cost. There are seven security levels: 0=nonsecure, 1 through 6=max.

- **#INTERSC**

This COS name maps to a mode named #INTERSC. It has the same characteristics as #INTER except that it provides at least a security level of 1 or, put another way, a security level that is not 0.

- **#CONNECT**

This COS name maps to a mode name containing eight blanks. This COS provides connectivity at medium transmission priority and is used for LU-LU sessions.

- SNASVCMG

This COS is for LU-LU CNOS sessions and provides connectivity at network transmission priority. It is not displayed on the COS Definition panel and, therefore, cannot be modified.

- CPSVCMG

This COS is for CP-CP sessions and provides connectivity at network transmission priority. It is not displayed on the COS Definition panel and, therefore, cannot be modified.

- CPSVRMGR

This COS is used to identify a session between a DLUS and a DLUR, two new components that reside in the CPs. The DLUS-DLUR pipe is very similar to CP-CP sessions identified by the CPSVCMG mode.

Values provided for the node and link (TG) characteristics in these COS tables are shown in Appendix E, "IBM Default COS Tables" on page 461.

Note that each of the IBM-supplied COS table names begins with a # character; this is a representation of X'7B' used in the architecture.

3.11.2 COS Table Manipulation

The IBM-supplied COS definitions should be used for most networking requirements. If the IBM-supplied COS tables do not meet your requirements, you may:

- Modify an IBM-supplied COS table.

Modifying an IBM-supplied COS table is not recommended. If it is modified, then every COS table in every network node in the network must be modified to contain the same values. If this is not done, then the same name is used for COS tables which contain different values from one another and would not be consistent.

- Create a new COS table using an IBM-supplied table as a model.
- Create a completely new COS table without using a model.

You can also delete a COS table, except the IBM-supplied COS tables, by modeling it on a Clear Definition table which does not contain any values. A warning message that the existing values will be overwritten is displayed. You can either continue the deletion by pressing Enter and then erasing the COS name, or quit by pressing PF3.

Notes:

1. The IBM-supplied tables SNASVCMG, CPSVCMG and CPSVRMGR cannot be displayed and therefore cannot be modified, used as models, or deleted.
2. The other five IBM-supplied tables can never be deleted.

Modifying or deleting an IBM-supplied COS table, or creating new COS tables, should only be undertaken with careful planning for unique environments.

```

          _____ COS Definition _____

Enter the number of the COS Definition and the number of the
definition to be used as a model.

COS Definition Number - __ 1      Model Definition Number - __ 2
(1-14)                  (0-14)

          -----Definition Numbers-----

3  0. Clear Definition
4  1. #BATCH      8. _____
    2. #BATCHSC   9. _____
    3. #INTER     10. _____
    4. #INTERSC   11. _____
    5. #CONNECT   12. _____
    6. _____ 13. _____
    7. _____ 14. _____

When using models 1-5, IBM-supplied defaults will always be invoked.

PF: 3=Quit      8=Fwd

```

Figure 45. COS Definition

1 The COS Definition Number is the COS table number you want to add or modify:

- If you enter a number from 1 to 5, you can modify one of the five IBM-supplied tables.
- If you enter a number from 6 to 14 and there is no name associated with that number, you can add a new COS table.
- If you enter a number from 6 to 14 and it is associated with a name, you can modify an existing user-defined COS table of that name.

2 You may choose to add a new COS table. To reduce the effort involved in creating a new table, the Model Definition Number allows you to select a table to be used as a model.

To add a new table using a model:

- Enter a COS Definition Number that is not associated with a name. This will be the COS Definition Number of the new table.
- Enter the Model Definition Number to be used as the model.

If you enter 0 (Clear Definition) or leave it blank, then you will not be using a model; the definition screens that follow contain blank fields and you will have to enter all values required.

Notes:

1. If a COS Definition Number from 1 to 5 is modeled on itself (that is, the COS Definition Number is the same as the Model Definition Number), a warning message that the existing values will be overwritten is displayed. This warning is provided to inform you that the IBM-supplied values will be presented and will replace all the values you have customized, if you continue by pressing Enter. If this is not desired, press PF3 to quit.
2. If a COS Definition Number from 6 to 14 is modeled on itself, no warning message is displayed because the values you have customized will be presented.

3. If a COS Definition Number from 1 to 14 is modeled on another COS Definition Number, a warning message that the existing values will be overwritten is displayed. This warning is provided to inform you that the values contained in the COS Definition Number table will be overwritten by values in the Model Definition Number table, if you continue by pressing Enter. If this is not desired, press PF3 to quit.
4. SNASVCMG, CPSVCMG and CPSVRMGR are IBM-reserved names and cannot be used as a COS table name or mode name.
5. If you modify an IBM-supplied COS table, you are actually modifying a *copy* of the IBM-supplied table. This modified copy is then filed and used for routing calculations.

When you select the same IBM-supplied table again, it will display the table with your customized values. To restore the IBM-supplied values, model the IBM-supplied table you have modified on itself.

3 Clear Definition presents you with definition screens that contain blank fields.

4 #BATCH is one of the five IBM-supplied COS tables. The IBM-supplied COS table names are the only names allowed to begin with a # character. You will not be able to enter this character in the COS name field; when you press the # key, nothing happens.

3.11.3 Mode/COS Correlation

The Mode/COS Correlation panel allows you to correlate a mode name with a particular COS table name. You can specify up to 14 mode/COS name correlations.

The first five mode names are automatically filled in and cannot be modified. The first four mode names are correlated to COS tables of the same name by default. The fifth mode name *blank*, is correlated to #CONNECT. You may specify a maximum of nine other mode names.

The mode name points to a set of parameters for LU-LU sessions. Each mode name also points to the COS table to be used. The mode name must be unique.

If a mode name is specified, the COS table name must also be specified. Similarly, if a COS table name is specified, a mode name must also be specified. You may have different mode names pointing to the same COS table, as shown in Figure 46 on page 90. But the same mode name may not be used to point to the different COS tables.

Since mode names and COS table names are used throughout a network, they must be used consistently.

Mode/COS Correlation					
Mode Name	#	COS Name	Mode Name	#	COS Name
#BATCH__	-	#BATCH__	_____	-	_____
#BATCHSC	-	#BATCHSC	_____	-	_____
#INTER__	-	#INTER__	_____	-	_____
#INTERSC	-	#INTERSC	_____	-	_____
blank	-	#CONNECT	_____	-	_____
5 QPCSUPP_	-	#CONNECT	_____	-	_____
_____	-	_____	_____	-	_____

Define Mode/COS pairs. To specify IBM-supplied COS names, place 1-5 in the #-column. 1=#BATCH 2=#BATCHSC 3=#INTER 4=#INTERSC 5=#CONNECT

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 46. Correlating Mode Names with COS Table Names

5 If you have APPC applications that use a mode name other than the IBM-supplied defaults, you must correlate that mode name to the COS table name it is to use. In the scenarios described later, 5250 emulation in OS/2 and AS/400 uses a mode named QPCSUPP by default. QPCSUPP is also mapped to the COS table #CONNECT in the AS/400 by default. Therefore, we have correlated QPCSUPP with the COS table named #CONNECT in the 3174, as shown in Figure 46. If this is not done, you will get an error message indicating session negotiation failure.

3.12 3174-Peer Definition

The 3174 Peer Communication, referred to in the customizing panels as the 3174-Peer Support, is separate and distinct from the APPN function. The 3174-Peer Support can be used as a means to allow coax-attached LEN nodes to connect to a token-ring APPN network.

Option 8 Define 3174-PEER is used in the Customize Control Disk Menu panel. See Figure 32 on page 69 to define the Peer Communication functions.

As shown in Figure 28 on page 63, the 3174-Peer Support provides a logical internal token-ring segment and a bridge to a real external token-ring segment. Each coax-attached PS/2 workstation appears to be attached to the internal token-ring.

In the customizing panel descriptions, the following terms are used:

- *3174-Peer device* to refer to a coax-attached PS/2 workstation
- *3174-Peer port* to refer to the coax port to which a PS/2 workstation is attached
- *3174-Peer bridge* to refer to the internal bridge
- *3174-Peer segment* to refer to the internal token-ring segment
- *Token-Ring segment* to refer to the external token-ring segment

Each 3174-Peer device can have a token-ring address:

- Specified as a DXML1MOD.SYS parameter in its CONFIG.SYS file, if you are using WPCSP, or as a NETADDRESS parameter in the IBMXLN stanza of the PROTOCOL.INI, if you are using the NDIS compliant driver.
- Assigned by the 3174-Peer Support according to its port number, with some portion of the address specified by the user.

The 3174-Peer Definition panels allow you to:

- Enable the internal token-ring segment
- Enable the internal bridge function
- Customize the internal bridge parameters
- Enable LAN Manager support
- Specify the middle six hexadecimal digits of the 3174-assigned token-ring address for the 3174-Peer devices

3174-Peer Definition

3174-Peer Support

650 - Y

3174-Peer Support

(Y,N)

3174-Peer Options

651 - Y

Bridge Support

(Y,N)

652 - N

LAN Manager Support

(Y,N)

653 - Y

3174-Peer Online Test Updates

(Y,N)

3174-Peer Station Parameters

660 - 4000 3174 91 PN

3174-Peer Port Address Range

(0000 00 - FFFF FF)

661 - 05

Percentage of Discard Threshold

(00 - 99)

PF: 3=Quit

4=Default

8=Fwd

Figure 47. Enabling 3174 Peer Communication Functions

3.12.1 Question 650: 3174-Peer Support

The response indicates whether the internal token-ring segment is to be enabled. Valid responses are:

Y = Yes

N = No (default response)

If the response is Y, then the Peer Communication function will be included and operational when the 3174 is IMLed. A Y response increases the total control storage required on the 3174.

3.12.2 Question 651: Bridge Support

The response indicates whether the internal bridge function is to be enabled. This bridge function requires that the 16/4 Mbps token-ring network adapter be installed in the 3174. Valid responses are:

Y = Yes

N = No (default response)

You must respond with a Y if you want the 3174-Peer devices to communicate:

- With devices on the external token-ring for server/requester functions, for example, a 3174-Peer device requester accessing an external server or an external requester accessing a 3174-Peer device server
- As LEN nodes to the 3174 network node (the 3174 you are now customizing)
- As LEN nodes to other APPN network nodes on the external token-ring segment
- As DSPUs to the 3174 gateway (the 3174 you are now customizing)

A Y response increases the total control storage required on the 3174.

3.12.3 Question 652: LAN Manager Support

The response indicates whether support for a LAN Network Manager is to be enabled. Valid responses are:

Y = Yes

N = No (default response)

If your response is Y, then LAN Network Manager will support the LAN Reporting Mechanism in the 3174-Peer bridge and provide functions such as:

- LAN Bridge Server
- Ring Parameter Server
- Configuration Report Server (for the 3174-Peer segment only)
- Ring Error Monitor (for the 3174-Peer segment only)

If the LAN Manager support is enabled, the 3174-Peer bridge must also be enabled (Question 651=Y).

Currently, there is no LAN Network Manager that can manage a 3174-Peer segment. You should respond with an N. With the LAN Manager support disabled, you can update 3174-Peer status and bridge profile parameters via the Online Test 9 (LAN tests).

A Y response increases the total control storage required on the 3174.

Note: With Configuration Support-C6, Source Route Remote Bridging over a frame relay network is added to the 3174. With this new function, you can update 3174-Peer status and bridge profile parameters via the Online Test 19, 3174 peer and bridge information. See the ITSO document *3174 Network Server in Frame Relay and Multiprotocol Networks*, GG24-4376 for more information.

3.12.4 Question 653: 3174-Peer Online Test Updates

The response is used with Questions 651 and 652 to determine the update options you are allowed to perform via the Online Test 9 (LAN Test) Menu. Valid responses are:

Y = Yes

N = No (default response)

Table 9. 3174-Peer Online Test Updates Allowed			
Q651: Bridge Support	Q652: LAN Manager Support	Q653: 3174-Peer Online Test Updates	Updates Allowed Via Online Test 9
Y	Y	Y	Test 9, option 12 LAN Manager profile
Y	N	Y	Test 9, option 9 3174-Peer status Test 9, option 10 3174-Peer bridge profile
N	N	Y	Test 9, option 9 3174-Peer status

You must enter a password in Question 98 (Online Test Password) if you want to use the 3174-Peer Online Test Updates capability. If a password is not provided in Question 98, this capability is deconfigured when the 3174 is IMLed.

3.12.5 Question 660: 3174-Peer Port Address Range

We have mentioned before that there are two ways to give a 3174-Peer device a token-ring address:

- As a DXML1MOD.SYS parameter in its CONFIG.SYS file, if you are using WPCSP.
- As a NETADDRESS parameter in the IBMXLN stanza of the PROTOCOL.INI file, if you are using the NDIS compliant driver.
- Assigned by the 3174 Peer Communication function according to its port number, with some portion of the address specified by the user

Question 660 allows you to enter the user-specified portion of the address.

The format of the address is shown in Figure 48.

4000 XXXX XXPN 1 2 3
--

Figure 48. Format of 3174-Peer Device Address

- 1** 4000 is a protected field and cannot be modified.
- 2** XXXX XX is the user-specified portion of the address. The valid range is from hexadecimal '000000' to 'FFFFFF'.
- 3** PN is the port number to which the 3174-Peer device is attached. This value ranges from 00 (HG26-00) to 63 (HG27-31).

As shown in Figure 47 on page 91, we have entered 317491 as the user-specified portion of the address. This means that a 3174-Peer device attached to port HG26-23 will have a 3174-assigned address of 400031749123. Another 3174-Peer device attached to port HG27-23 will have a 3174-assigned address of 400031749155.

Note: The *3174 Planning Guide* description for Question 660 gives an impression that the addresses in this example would be 400031749117 (port HG26-23 decimal 23 converted to X'17') and 400031749137 (port HG27-23 decimal 55 converted to X'37'). Using Online Test 9 Option 9, the addresses are displayed with the port numbers in decimal.

Also, if the LAN Manager Support is enabled in Question 652, then the 3174 has an address with a PN of FF on the internal token-ring. In our example, this address is 4000317491FF.

Note that if an address is specified via the DXML1MOD.SYS driver or the NETADDRESS in the PROTOCOL.INI file, the following conditions exist:

- It will override the 3174-assigned address.
- It must be outside the range of addresses available for assignment by the 3174 if you wish to have port-independent addressing. In our example, it should be outside the range 400031749100 to 400031749163.
- It must not be the address of the 3174 when the LAN Manager Support is enabled. In our example, it must not be 4000317491FF.

If the 3174-Peer Support and the Bridge Support are both enabled, you should check that no other device uses any of the 3174-Peer Support addresses in Questions 106, 107, 900 and 940.

Recommendation: We recommend that you specify 3174-Peer device addresses as LAAs at the workstation. This will give you addressing independent of the port numbers and allow 3174-Peer devices to be swapped from one port to another without problems.

3.12.6 Question 661: Percentage of Discard Threshold

As a 3174-Peer device becomes congested, it cannot receive as many frames and starts to discard those it cannot receive. The more frames it discards within a given interval, the more congested the device becomes.

Question 661 allows you to specify a threshold to use in deciding when a device has become congested. The valid range of response is 00 to 99. The default response is 05; this means that we consider a device to be congested if more than 5% of the frames are discarded in any one-minute interval. If you specify 00, it means that we consider a device to be congested if it discards any frame at all in any one-minute interval.

3.13 3174-Peer Bridge Profile

The 3174-Peer Bridge Profile panel allows you to specify parameters to be used by the internal bridge function. These parameters include:

- The internal bridge number
- The internal token-ring segment number
- The external token-ring segment number
- The number of hops over which a broadcast frame can cross
- Whether frames will be forwarded by the bridge
- Setting threshold for bridge congestion
- How long to wait before logging a bridge congestion
- How long to wait before sending an alert about a bridge congestion

3174-Peer Bridge Profile

670 - 1	Bridge Number	(0-F)
671 - BB3	Token-Ring Segment Number	(001-FFF)
672 - 741	3174-Peer Segment Number	(001-FFF)
673 - 7	Token-Ring Hop Count	(1-7)
674 - Y	Frame Forwarding Active	(Y,N)
675 - 0010	Bridge Performance Threshold (Frames Discarded Per 10,000)	(0000-9999)
676 - 02 00	Logging Interval	(00-99 Hours 00-59 Minutes)
677 - 010	Alert Threshold	(000-255)

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 49. Parameters for The Internal Bridge Function

3.13.1 Question 670: Bridge Number

The response assigns a number to the internal 3174-Peer bridge. The valid range of response is a hexadecimal value from 0 to F, with 1 being the default. The bridge number is required for source routing.

If there is more than one 3174-Peer segment on the same token-ring, the 3174-Peer bridge number can be the same for all the 3174-Peer bridges.

3.13.2 Question 671: Token-Ring Segment Number

The response assigns a number to the external (real) token-ring segment. The valid range of response is a hexadecimal value from 001 to FFF, with no default. It is required for source routing.

If the 3174 is attached to an existing token-ring, you should use the segment number already assigned to the token-ring for Question 671.

If an IBM Token-Ring Network Bridge Program station is active on the token-ring, you must use the segment number assigned by the Bridge Program for Question 671. If the numbers do not match, the 3174-Peer bridge will not be able to communicate on the token-ring.

If there are more than one 3174-Peer segments on the same token-ring, the token-ring segment number must be the same for all the 3174-Peer segments (this is obvious, since they are attached to the same token-ring).

The token-ring segment number, however, cannot be the same as the 3174-Peer segment number.

3.13.3 Question 672: 3174-Peer Segment Number

The response assigns a number to the internal token-ring segment (the 3174-Peer segment). The valid range of response is a hexadecimal value from 001 to FFF, with no default.

If there is more than one 3174-Peer segment on the same token-ring, the 3174-Peer segment number must be different for all the 3174-Peer segments. It must also be different from the token-ring segment number. If the token-ring is bridged to other token-rings, you must ensure that all 3174-Peer segment numbers are unique throughout the network.

3.13.4 Question 673: Token-Ring Hop Count

The response specifies the maximum number of bridges that a broadcast frame can cross. The valid range of response is a from 1 to 7, with 7 as the default.

Note that the 3174-Peer bridge is counted as one hop when frames cross from the 3174-Peer segment to the external token-ring or vice versa.

3.13.5 Question 674: Frame Forwarding Active

The response indicates whether the 3174-Peer bridge is to forward frames it receives. Valid responses are:

Y = Yes (default response)

N = No

If the response is Y, the 3174-Peer bridge will forward frames and process frames received from the token-ring.

If the response is N, the 3174-Peer bridge will stop forwarding frames received from the token-ring. In fact, it will discard any frames it receives and stop incrementing the discard frame counters.

3.13.6 Question 675: Bridge Performance Threshold

The response specifies the maximum percentage of information frames that may be discarded by the internal bridge within a one-minute interval before a count is incremented. The valid range is from 0000 to 9999; the number is in hundredths of a percent or the number of frames per 10,000. The default is 0010 and means that the discard counter will be incremented by one if 0.1% (10 hundredths of a percent) of the frames received within any one-minute interval are discarded. It is the same as saying the discard counter will be incremented by one if 10 out of every 10,000 frames received within any one-minute interval are discarded.

A separate count is maintained for frames received from the token-ring and frames received from the 3174-Peer segment.

3.13.7 Question 676: Logging Interval

When the internal bridge performance threshold is exceeded at the end of a one-minute interval, the bridge is congested. To measure how serious the congestion is, you can specify an interval during which the congestion is monitored.

The monitoring begins at the end of the one-minute interval when the congestion occurred, counting that one-minute interval as the first minute of the monitoring interval. At the end of the monitoring interval, the Log Manager is invoked to record the number of minutes in that interval during which the bridge was congested. The number of minutes and a non-alertable status code are recorded in the event log. This information is time stamped.

Question 676 allows you to set the monitoring interval. The valid range of response is from 00 Hours 00 Minutes to 99 Hours 59 Minutes, with the default being 02 00 (every two hours). If 00 Hours 00 Minutes is specified, then no logging of the bridge congestion is invoked. If you specify any interval other than 0000, then logging begins only after bridge congestion has been detected.

3.13.8 Question 677: Alert Threshold

Within the monitoring interval set by Question 676, you can set another threshold to raise an alert if the congestion is serious. Question 677 allows you to set this alert threshold. The valid range of response is from 000 to 255, with a default of 010 minutes.

Using the default logging interval (0200) and default alert threshold (010) as an example, if bridge congestion is detected then monitoring begins. If bridge congestion total time is less than 10 minutes (the alert threshold), no alert is raised and logging is invoked at the end of two hours.

When bridge congestion total time reaches 10 minutes (the alert threshold), an alert is raised, the Log Manager is immediately invoked to record a status code and the alert threshold in the event log and the logging interval is treated as though it has completed.

3.13.9 3174-Peer Bridge Profile Online Test Update

Once the 3174 is IMLed successfully, it is important to review Questions 670, 671, 672 and 674 in the 3174-Peer Bridge Profile and verify that they match with the responses specified during the customization.

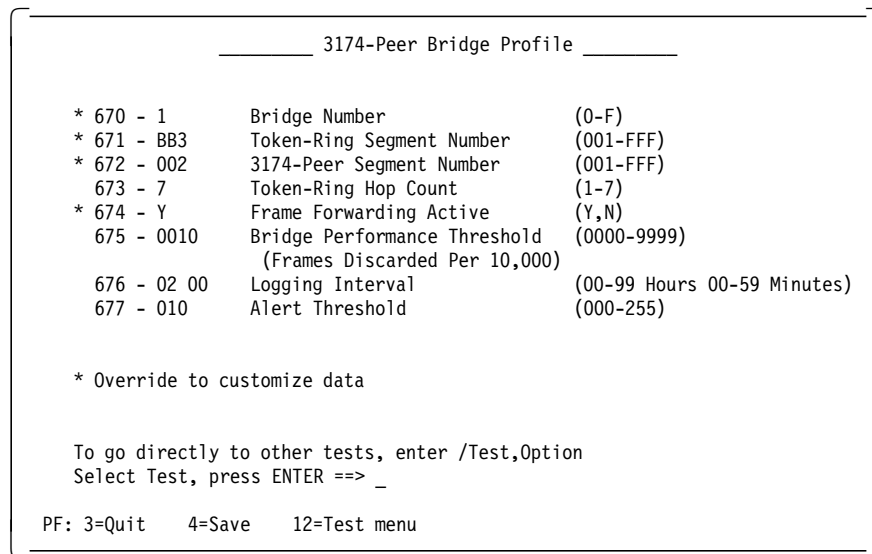
You can review the 3174-Peer bridge profile by taking Option 9 (LAN Tests) from the 3174 Test Menu (1 TEST) and then by taking Option 10 (3174-Peer bridge profile).

If there is a mismatch, go back to the LAN Test Menu and take Option 10, u (3174-Peer bridge profile). Then enter the online test password entered in Question 098 and the panel shown in Figure 50 is displayed.

For Configuration Support-C6, you need to select Option 19 (3174 peer and bridge information) instead of Options 9/10 that are only available in previous releases.

Notes:

1. The parameter u is not displayed on the panel.
2. You need to specify an online test password (Question 098) and a Y for Question 653 (3174-Peer Online Test Updates) in the 3174-Peer Definition panel.



3174-Peer Bridge Profile

* 670 - 1	Bridge Number	(0-F)
* 671 - BB3	Token-Ring Segment Number	(001-FFF)
* 672 - 002	3174-Peer Segment Number	(001-FFF)
673 - 7	Token-Ring Hop Count	(1-7)
* 674 - Y	Frame Forwarding Active	(Y,N)
675 - 0010	Bridge Performance Threshold	(0000-9999)
	(Frames Discarded Per 10,000)	
676 - 02 00	Logging Interval	(00-99 Hours 00-59 Minutes)
677 - 010	Alert Threshold	(000-255)

* Override to customize data

To go directly to other tests, enter /Test,Option
Select Test, press ENTER ==> _

PF: 3=Quit 4=Save 12=Test menu

Figure 50. 3174-Peer Bridge Parameters with Online Test Update

The responses of the Questions (670, 671, 672 and 764) can be changed. Press PF4 to save the data.

3.13.10 LAN Manager Profile

The LAN Manager Profile panel allows you to specify a password for each reporting link. The following rules apply to the reporting link passwords:

- The passwords need not be unique.
- Each password must be six to eight characters in length.
- Each character must be in the range 0-9 and A-Z.

- No blanks preceding or imbedded in the password are allowed.
- The default is all blanks (no password specified).

```

_____ LAN Manager Profile _____

690 -      Reporting Link 0 Password
691 -      Reporting Link 1 Password
692 -      Reporting Link 2 Password
693 -      Reporting Link 3 Password

```

Figure 51. LAN Manager Profile Panel

The following questions allow you to specify the passwords:

- Question 690: Reporting Link 0 Password
- Question 691: Reporting Link 1 Password
- Question 692: Reporting Link 2 Password
- Question 693: Reporting Link 3 Password

3.14 WAN Profiles

X.25 Circuit Profiles panel is provided when you select Option 9 Define WAN Profiles in the Customize Control Disk Menu panel. This option became available in Configuration Support-C5 and it is used to define the WAN circuit subscriber profiles for X.25 links.

When you are configuring for X.25 APPN nodes, you must fill out the X.25 Circuit Profile panel to be used for all connections you want the 3174 to initiate.

```

_____ X.25 Circuit Profiles _____

1  401 - 4
    420 - 10000000      421 - 10000000
    430 - 1             432 - 07
    440 - A             441 - ____      442 - ____
    453 - 10000000

2  401 - 4
    420 - 10000000      421 - 00000000
    430 - 1             432 - 07
    440 - A             441 - ____      442 - ____
    453 - 10000000

Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu

```

Figure 52. X.25 APPN Nodes

3.14.1 Question 401: Circuit Type

The input field indicates the circuit type for this virtual circuit:

- 1=Permanent virtual circuit (PVC)
- 2=Incoming call (from host) only (SVC)
- 3=Outgoing call (to host) only (SVC)
- 4=Two-way call (SVC)

3.14.2 Question 420: Incoming Call Options

Your response specifies how to process fields in an incoming call. If you are planning for X.25 single-link multiple host support, you may be required to answer digits 1 and 6 with 1 if more than one of your virtual circuit definitions allows incoming calls (401=2 or 4).

3.14.3 Question 421: Outgoing Call Options

Your response specifies the fields to include in an outgoing Call Request packet.

3.14.4 Question 430: Negotiated Packet (NPKT) or PVC Packet Size

This question defines the negotiated packet size. If you are configuring for PVCs, the packet size is not negotiated but remains constant at the value you select here.

3.14.5 Question 432: Negotiated Window Size (NWND) or PVC Window Size

This question defines the negotiated window size. If you are configuring for PVCs, the window size is not negotiated but remains constant at the value you select here.

3.14.6 Question 440: Throughput Class Negotiation (TCLS)

Throughput class is a network facility that sets priority for packets.

3.14.7 Question 441: Closed User Group (CUG)

You should include closed user group facility in the outgoing Call Request packet.

3.14.8 Question 442: Recognized Private Operating Agency (RPOA)

As an option you can enter a value for the recognized private operating agency facility if this applies to your system.

Chapter 4. Hardware and Software Requirements

This chapter briefly describes the hardware and software requirements that are needed to implement the 3174 Advanced Peer-to-Peer Networking functions in Configuration Support-C.

4.1 Hardware

To implement APPN functions, the following 3174 models are required:

- Older models: 1L, 1R, 2R, 3R, 51R and 53R
- Newer models: 11L, 11R, 12L, 12R, 13R, 61R, 62R, 63R, 14R, 64R, 41R and 43R (4xRs are WNMs)
- Rack-mounted models: 21L, 21R, 22L, 23R and 24R

Notes:

1. Models 81R, 82R, 90R, 91R and 92R are not supported because they have only one diskette drive at maximum. In addition, they do not support any fixed disk drive or storage expansion features. The maximum control storage on these models is as follows:
 - 81R and 82R: 1 MB
 - 90R, 91R and 92R: 2 MB
2. Model 52R is not supported because its maximum control storage is 1.5 MB.

4.1.1 3174 Control Storage

The amount of control storage required to support Config Support-C is as follows:

- 2050 KB is the minimum control storage required to support base microcode functions.
- 3 MB is the minimum control storage required to support APPN functions.
- Additional control storage is required for Peer Communication functions, over and above those required for the base and other functions such as APPN, AEA, MLT, Multi-Host, SLMH, 3270 Port Expansion, CSCM and so on.

4.1.2 APPN Storage Requirements

When customizing the 3174 for APPN functions, the following will affect the amount of control storage required:

- Question 610: APPN Sessions indicates the number of LU 6.2 intermediate sessions to be supported.
- Question 611: APPN Nodes/Links indicates the number of T2.1 links to adjacent nodes to be supported and the topology database size.

The response can be from 1 to 4, corresponding to levels of APPN support. The default response for Question 610 is 1 (225 sessions) and for Question 611 is 1 (20 links). This default combination requires 968 KB of storage in addition to the 2050 KB base requirement.

Table 10 shows the additional amounts of storage required when APPN functions are desired.

<i>Table 10. APPN Additional Storage Requirements (KB)</i>				
	Q611=1 (20)	Q611=2 (75)	Q611=3 (150)	Q611=4 (225)
Q610=1 (225)	968	1188	1666	1966
Q610=2 (500)	1408	1628	2106	2406
Q610=3 (750)	1808	2028	2506	2806
Q610=4 (1000)	2208	2428	2906	3206

The following are additional storage requirements with Configuration Support-C5:

- Frame relay without frame relay host: 90 KB
- Optional LAN adapter without LAN gateway or TCP/IP over LAN: 80 KB

4.1.3 Peer Communication Storage Requirements

When customizing the 3174 for Peer Communication functions, the following will affect the amount of control storage required:

- Question 650: 3174-Peer Support indicates whether Peer Communication functions are to be enabled.
- Question 651: Bridge Support indicates whether the internal bridge function is to be enabled.
- Question 652: LAN Manager Support indicates whether support for a LAN Network Manager is to be enabled.

The response can be N if the function is not to be enabled or Y if the function is to be enabled. Each function to be enabled requires additional storage.

Table 11 shows the additional amounts of storage required when Peer Communication functions are desired. Note that the amounts are more if the 3270 Port Expansion is installed.

<i>Table 11. Peer Communication Additional Storage Requirements (KB)</i>			
	Q650=Y	Q650=Y + Q651=Y	Q650=Y + Q651=Y + Q652=Y
Without 3270 Port Expansion	82	181	250
With 3270 Port Expansion	129	278	347

4.1.4 Total Storage Requirements

To calculate the total storage required, you should refer to the *3174 Establishment Controller Planning Guide*, GA27-3918.

Worksheet 49—Storage Requirements: Chapter 3 of the *3174 Planning Guide* contains the procedure for filling in this worksheet.

4.1.5 Deconfigure

If sufficient storage is not installed to support the features and functions for the configuration you have planned, the 3174 will deconfigure most of these features and functions when it is IMLed. You will then be left with a minimal configuration which allows you to attach to an SNA host link, use CSCM, send alerts and perform RAS online tests.

The minimal configuration will not support any of the following:

- MLT
- AEA
- 3270 Port Expansion
- Concurrent Communication Adapter
- Multi-Host
- Token-ring or ISDN gateway
- Local Format Storage
- Peer Communication
- APPN

4.1.6 3174 Other Hardware

Other hardware required to run Configuration Support-C is as follows:

- Either one of the following:
 - Two 2.4 MB diskette drives
 - One 2.4 MB diskette drive and one hard disk

A hard disk is recommended for the following reasons:

- The hard disk will provide speedier customization without frequent diskette swapping.
- The hard disk can store more than one version of microcode and/or customization data objects to support Central Site Change Management (CSCM). See *NetView Distribution Manager Release 2 and 3174 Central Site Change Management Implementation Guide*, GG24-3424, or *NetView DM/2 V2.1 Remote Administrator and New Functions*, GG24-4419.
- The directory database contains information from customization as well as information learned during network operation. The information that is learned is cached in control storage.

If a hard disk is available, the cached information is copied from control storage to the hard disk periodically. When a re-IML is required, the cached information saved on the hard disk is reloaded into control storage. Thus, the 3174 network node does not have to re-learn the information contained in the cached entries.

- Configuration Support-C5 APPN feature removes the requirement for a LAN adapter for the APPN feature. That is, the 3174 can be customized as an APPN network node (NN) without a LAN adapter installed.

When Peer Communications functions are required:

1. If only Peer Communications is required between devices attached to the same 3174, then a token-ring adapter is not required. This means that no host communication, no bridging to a token-ring network and no APPN functions are available.
2. If host access or bridging to a token-ring network or APPN functions are required from Peer Communication devices, then the 16/4 Mbps token-ring adapter is required. Each of these functions requires the bridging code, which is available only in the 16/4 Mbps token-ring adapter.

4.1.7 Software

Configuration Support-C is packaged in three diskettes:

- One Control diskette
- One Control Extension diskette
- One Utility diskette

See Chapter 1, "3174 APPN Implementation" on page 1 for the distribution of features and functions for these diskettes for each release.

The Control and Control Extension diskettes contain the base microcode functions. The Control Extension diskette is also used to contain the microcode required to support the ISDN Basic Rate Interface Adapter and the Downstream Load (DSL) microcode required for other DSL functions such as frame relay and graphics terminals.

Note: Starting with Configuration Support-C5, the APPN feature, Peer Communications feature, and the AEA feature code are pre-merged onto the Extension diskette. You no longer need to order the APPN or Peer Communication feature to receive the code, nor do a DSL merge of the feature code. The 3174 frame relay feature is not pre-merged in the Extension diskette.

4.1.8 APPN and Peer Communication LIC Feature Numbers

<i>Table 12. APPN and Peer Communication LIC Feature Numbers</i>		
Desired Feature	3174 Model	Feature Number
APPN LIC Feature	01L, 01R, 02R, 03R, 11L, 11R, 12L, 12R, 13R, 21H, 21L, 21R, 22L, 23R	#7010
APPN LIC Feature	51R, 53R, 61R, 62R, 63R	#7060
Peer Communication LIC Feature	01L, 01R, 02R, 03R, 11L, 11R, 12L, 12R, 13R, 21H, 21L, 21R, 22L, 23R	#8010
Peer Communication LIC Feature	51R, 53R, 61R, 62R, 63R	#8060

To install APPN functions on the 3174, you need the following microcode:

- Config Support-C base microcode
- APPN Licensed Internal Code feature
- Peer Communication Licensed Internal Code feature (optional)

You only need the Peer Communication LIC feature if you have coax-attached workstations participating as LEN nodes in the APPN network.

Chapter 5. APPN VTAM Considerations

With the release of VTAM Version 4 Release 1, VTAM fully participates as an APPN node in an APPN network. Before then, subarea and APPN networks could interwork (via low entry networking connections) but could not be said to be fully integrated. In VTAM V4R1, for the first time, the strengths of APPN (dynamic peer-to-peer communication) are available. APPN sessions can now be routed over a subarea network, and dependent LU sessions can traverse an APPN network. The search and route selection mechanisms are brought together in VTAM's interchange node implementation.

With VTAM Version 4 Release 2, restrictions such as host-to-host channel connection and APPN connection across all network boundaries are addressed and functions, such as the Dependent LU Server (DLUS), are introduced. The DLUS function gives the dependent LUs the full APPN connectivity and routing facilities that independent LUs have enjoyed. The DLUS enhancement is utilized by the 3174 through the Dependent LU Requester (DLUR) function introduced by Configuration Support-C5.

VTAM V4R1 and later can be configured as one of the following:

- Subarea VTAM (as with previous releases)
- APPN node (EN and NN)
- Combination subarea and APPN node

When VTAM performs the functions of a subarea, the 3174 network node must be boundary-attached to the subarea for independent LUs that need to communicate to or through a subarea (LEN connection). Depending on the VTAM release you are using, each independent LU in an APPN network that requires subarea connectivity may have to be defined to the subarea with the PU definition for the boundary attached 3174 NN. Dynamic definition of independent LUs is supported in VTAM V3.4 and later.

DLUS support is not available when VTAM is a subarea node only.

When VTAM performs the functions of a subarea in combinations with an APPN NN or EN, it is considered an Interchange Node (ICN) or a Migration Data Host (MDH), respectively.

An Interchange Node (ICN), which is composed of VTAM Version 4 Release 1 or later, acts as an APPN NN and one or more NCPs (NCP 6.2 or later) acting as T2.1 node; it is also referred to as a Composite Network Node (CNN). This composition is viewed as a single network node by all other nodes in the APPN network.

As a Migration Data Host, VTAM Version 4 Release 1 acts as an APPN end node and a subarea data host. Just as with the subarea data hosts of pre-VTAM Version 4 Release 1, a Migration Data Host cannot own NCPs. On both the subarea and APPN sides, intermediate session routing is not allowed.

Refer to the following table for the characteristics found with each VTAM node type.

VTAM Node Type	Characteristics
Subarea VTAM	• Appears to the APPN network as a LEN EN • Operates as a “pure” subarea node • Supports SSCP-to-SSCP sessions, but does not support CP-CP sessions • When defined on the 3174 Network Resource Qualifiers panel, is defined as a LEN SSCP • Same support as VTAM V3R4.x
Interchange Node	• Appears as a subarea node to the subarea and a NN to the APPN network • Coexists in subarea and APPN network simultaneously • Supports SSCP-to-SSCP sessions in the subarea and CP-CP sessions in the APPN network • Provides intermediate session routing • VTAM start options NODETYPE, CPCP (optionally) and SUBAREA are coded in the VTAM start list
Migration Data Host	• Appears as a subarea node to the subarea and a EN to the APPN network • Supports SSCP-to-SSCP sessions in the subarea and CP-CP sessions in the APPN network • Coexists in subarea and APPN network simultaneously • Does not provide intermediate session routing • VTAM start options NODETYPE, CPCP (optionally) and SUBAREA are coded in the VTAM start list
End Node(EN) Host	• Appears as EN to the APPN network • Supports SSCP-to-PU and SSCP-to-LU subarea, but does not support SSCP-to-SSCP session. Supports CP-CP sessions in the APPN network • Registers its resources with it network server • Does not provide intermediate session routing • VTAM start options NODETYPE, CPCP (optionally) and SUBAREA are coded in the VTAM start list

Note For further information on EN and NN general characteristics, see B.9, “Node and LU Types” on page 445.

Regardless of the VTAM node type, the following items are to be considered when planning connections between the 3174 APPN network node and the subarea:

- VTAM start list
- Link type definition
- Mode name and COS
- Gateways and APPN

5.1 VTAM Start List

The VTAM node type is established during VTAM startup based on values assigned to the NODETYPE and SUBAREA start options in the VTAM start list. When the 3174 APPN network node is defined to VTAM as a T2.1 PU (XID=YES), how the VTAM node appears to the 3174 APPN network node (LEN SSCP, EN or NN) is determined by the start options. If the 3174 is defined as T2.0 PU (XID=YES not coded), the value of the VTAM start options must include SUBAREA, but the value of NODETYPE is irrelevant (VTAM appears as a pure subarea node).

NODETYPE does not have a default value; thus, coding must include a value of NN, EN or LEN. For VTAM to participate in the APPN network as an APPN node, NODETYPE must be coded as NN or EN. Exclusion of NODETYPE implies that VTAM is a subarea node.

The SUBAREA start option is required when VTAM is a subarea node or combination subarea/APPN node. VTAM4 configured as a pure APPN node (without support for subarea networks) must not include the coding of SUBAREA, even though a subarea number is used internally by VTAM.

5.2 Link Type Definition

The type of link that is established between the 3174 and VTAM is determined by the type of XID that is sent by the host primary link station. The 3174 APPN network node requires an APPN connection to VTAM, thus the link must be type T2.1 capable. When only a subarea connection is required, a pure link type T2.0 is satisfactory. The link type must match the node definitions in VTAM and the 3174 or the link may fail or downgrade to a lesser link type (for example T2.1 downgrade to a T2.0 link).

5.2.1 T2.1 Links

To define a 3174 NN to the host, the PU statement for the 3174 in VTAM/NCP (or NPSI in the case of X.25) requires an additional parame/the type of link all non-switched connections. For example:

```
name    PU    ADDR = ....., XID = YES
```

This additional parameter, XID = YES, ensures that the host (the primary logical unit) will send an XID3 to the boundary attached 3174 NN indicating a T2.1 link establishment request.

To explicitly define an independent LU 6.2 to VTAM/NCP, the LOCADDR parameter of the LU definition statement must be set to zero (LOCADDR = 0). Specifying the DYNLU parameter (DYNLU = YES) eliminates the requirement to explicitly define LUs.

Because the host and the 3174 are capable of T2.1 definitions, the order in which the definition is done can be important. For LAN (token-ring and Ethernet), and WAN (SDLC, X.25 and Frame Relay) host attachment, the 3174 NN and host may be defined in any order. However, unless both the host and 3174 NN definitions indicate a T2.1 node, a T2.0 link connection is established.

For channel attachment, the 3174 NN and host definitions must be made concurrently. The following definition combinations will fail at link establishment:

- Host VTAM definition indicates that the 3174 PU is PU2.0 and 3174 definition (Question 510 = 1 and 242 = 1) indicates T2.1.
- Host VTAM definition indicates that the 3174 PU is T2.1 and 3174 definition (Question 510 = 0 and 242 = 0) indicates T2.0.

5.2.2 Shared T2.0/2.1 Link Support

To support a T2.1 link connection between a subarea network and a 3174 network node, VTAM and NCP needs to support T2.1 peripheral nodes. The minimum levels of VTAM and NCP required are detailed in 5.6, "Prerequisites" on page 112.

The 3174 network node can support multiple T2.1 link connection to the subarea network. Configuration Support-C3 brought support for parallel and Multitail transmission groups. In addition, the T2.1 link connection is supported on the primary link only and is not supported by the Concurrent Communication Adapter. If the host connection fails, the route to the host is not available. The 3174, however, can continue to function as an APPN network node.

For T2.1 links to 37xx, the frame size needs to be set to 521 bytes. This is because LU 6.2 BINDs can exceed 256 bytes and NCP does not provide reassembly of BINDs. Therefore, your response to Question 370: Maximum Inbound I-Frame Size must be 1 (521 bytes maximum) when customizing the 3174.

For T2.1 links via the S/370 channel, the host Read Channel Program size (VTAM IOBUF) should at least be 1033 bytes. If the Read Channel Program size is less than 1033 bytes, the 3174 will not reassemble all data I-frames and may affect overall performance. Therefore, your host definition should reflect the recommended size.

The 3174 network node must also maintain a T2.0 link for dependent LUs that are attached. LU types 1, 2 and 3 are dependent upon SSCP and PU 2.0 functions. When running microcode prior to Configuration Support-C5, an SSCP-PU session is required to transport network management vectors to NetView (alerts), network asset management and Central Site Control Facility. In this case the subarea host must, therefore, support both T2.0 and T2.1.

Configuration Support-C5 provides Management Services (MS) transport architecture interfaces to allow alerts to flow to the focal point on an LU 6.2 session and T2.1 traffic. This means that the requirement for a T2.0 link for network management no longer exists.

Shared link support allows dependent LU traffic for 3174-attached devices and independent LU 6.2 traffic from the APPN network to use the same link station address.

A 3174 network node may also act as a token-ring gateway for downstream devices. The combined 3174 network node/token-ring gateway provides shared link support to its downstream PUs. This shared link support allows a downstream PU (DSPU), which is also a LEN node, an end node, or a network node, to use a single link connection to transport T2.0 traffic for SSCP-PU, SSCP-LU and dependent LU-LU sessions and T2.1 traffic for independent LU 6.2 sessions to the 3174 network node/token-ring gateway.

Figure 53 shows an example of shared link support.

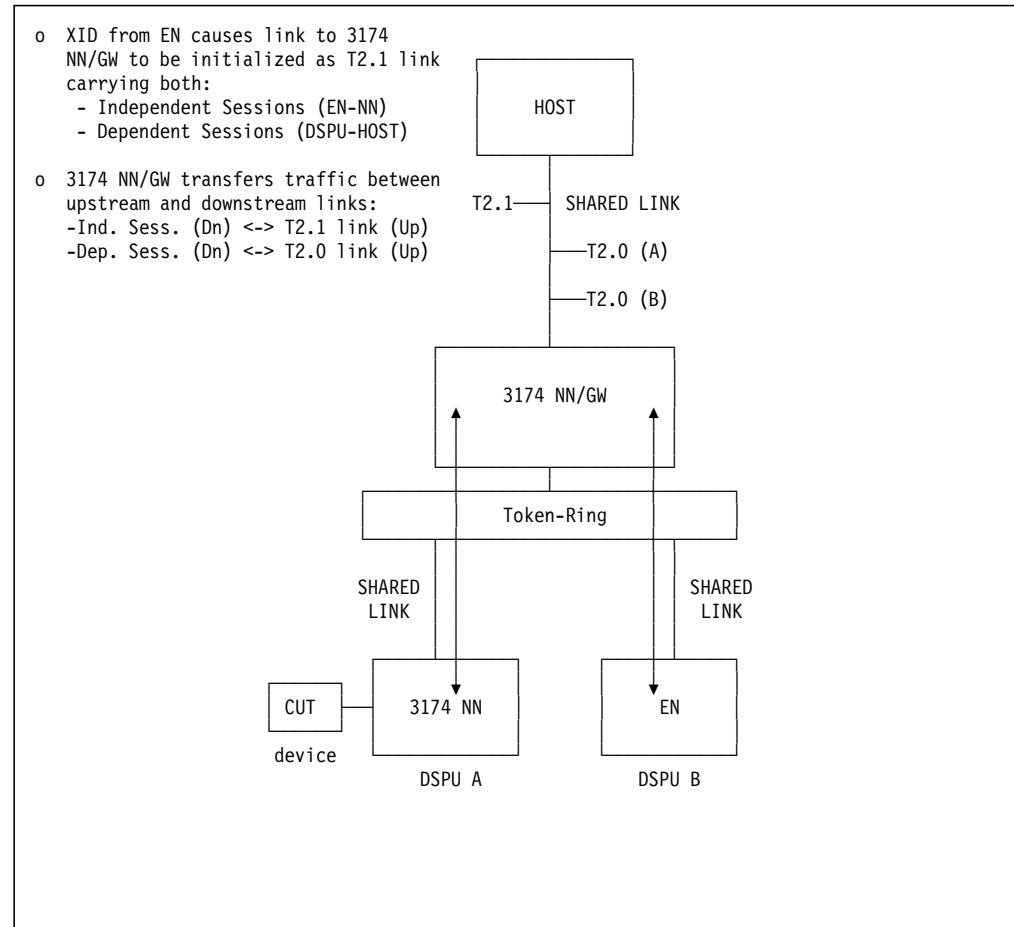


Figure 53. Shared T2.0/2.1 Link Support Example

5.3 Mode Name and COS

For those independent LUs in the APPN network that require sessions through a VTAM/NCP to independent LUs in another APPN network, the following guidelines for defining VTAM/NCP are recommended:

- Include a mode name specified in the MODETAB parameter of the LU or associated PU definition statement.
- The VTAM mode table (MODETABL) should be updated with an entry (MODEENT) for the mode name specified on or associated with the LU definition. This entry should specify a COS name.

- The VTAM Class-of-Service Table (COSTAB) should be updated with an entry for the COS name specified in the mode table.
- All APPN nodes must have corresponding mode name and COS name definitions to the defined to the host.

5.4 SSCP Takeover

SSCP takeover allows one SSCP to gain ownership of NCP boundary attached connections for another failed SSCP, without breaking the connections or disturbing existing LU-LU sessions on the connection. This was previously a purely subarea function, but it has been extended to APPN boundary connections with VTAM Version 4 Release 1.

The 3174 with Configuration Support-C Release 3 and later is able to participate in the SSCP takeover process, as a boundary attached node, by implementing the following:

- Nonactivation XID3 exchange and TG quiescence
- CP name change
- TG number change

Note: For Configuration Support-C Release 5, PTRB00B is required to SSCP takeover for X.25 or Frame Relay links

For more information on the 3174 implementation for SSCP Takeover, refer to 1.6, “3174 and VTAM SSCP Takeover” on page 38.

5.5 Multiple Link Support (Multitail)

Prior to VTAM V3R4 (Version 3 Release 4) there could only be a single LEN T2.1 connection to the subarea from an APPN Network. VTAM V3R4 removed the single LEN T2.1 link restriction by allowing VTAM to accept *blind binds* over T2.1 links. This implied that LUs no APPN longer need to be defined in the subarea, and made it possible for other products to support multiple links from the APPN network to the LEN subarea. This multiple link support is called Multitail. With Multitail there can be parallel connectivity by providing a combination of LEN T2.1 TGs.

5.6 Prerequisites

For a T2.1 host link connection, support for T2.1 peripheral nodes is needed VTAM and NCP.

To support Subarea VTAM and NCP, the subarea host systems must have the following or later levels of VTAM and NCP:

- VTAM V3.2 for SDLC
- VTAM V3.3 for 4361, ES/9370, or VM S/370 channel
 - APAR #VM45562 for VTAM V3R3
 - APAR #VM45886 for VTAM V3R3
 - APAR #VM45911 for VTAM V3R3

- VTAM V3.4 or higher for MVS/ESA S/370 channel
- NCP V4.3.1 for 3725
- NCP V5R2.1 or V5R3 or higher for 3720 or 3745

To support APPN VTAM and NCP:

- VTAM V4R1 for central directory server (CDS).
- VTAM V4R2 for border node and DLUR/DLUS support.
- NCP V6R2 or higher.
- For APPN X.25 links to the host, NPSI Version 3 Release 5 or higher is required.
- For APPN Frame Relay links to the host, NCP Version 7 Release 1 or higher is required.

Chapter 6. AS/400 Considerations

AS/400 was the grandfather of all APPN implementations. APPC/APPN support is part of the base OS/400 operating system. The AS/400 can implement the two types of APPN nodes (the AS/400 network node and the AS/400 end node). It can also act as a low entry networking (LEN) node. Basically, the network node provides a full suite of AS/400 APPN functions while the end node provides a subset of APPN functions. In particular, low entry network and end nodes do not perform intermediate session routing. The AS/400 also supports independent as well as dependent LUs on the same controller description.

Prior to Configuration Support-C3, the 3174 could connect to AS/400 with the 3174 Network Node over a token-ring link only. As a part of the APPN enhancements first made available in Configuration Support-C3, transfer of APPC and 3270 data streams across a single SDLC or token-ring link between the 3174 and an AS/400 is possible. This link can be dynamic or explicitly defined in the AS/400 and/or 3174. With the APPN enhancements in Configuration Support-C5, the link types available between the 3174 and AS/400 include frame relay and X.25 as well as the support of communications across different networks. Support for communications support is usually called *border node support*.

6.1 AS/400 Border Node Support

AS/400 border node support is formally called Multi-Network Connectivity. An APPN border node provides the capability for nodes in multiple independent networks to communicate as if they are in the same network. This is important when division of functions or corporations are reflected in the network's layout (where there are different network IDs but cross function/corporation communications is required).

Prior to Configuration Support-C5, the 3174 was unable to communicate with an adjacent AS/400 with a different network ID, thus could not take full advantage of the AS/400 border node support. The 3174, however, could participate in APPN networks that were connected by the AS/400 Multi-Network Connectivity (border node support) capabilities. Configuration Support-C5 removes this restriction by providing border node coexistence support. This means that the 3174 no longer requires that all adjacent APPN network nodes be in the same network (have the same NetID) as the 3174.

6.2 Terminology

There are three descriptions used for APPC/APPN communications on the AS/400. They are based on the subarea concepts of *LINE*, *PU*, and *LU*. These are:

- Line Description

The Line Description describes the physical line connection to be used between the AS/400 and the network. This is equivalent to the LINE resource definition in an NCP. For connection to or through the 3174, the descriptor can be either for a LAN (token-ring and Ethernet) or WAN (SDLC, X.25 and Frame Relay) connection.

- Controller Description

The Controller Description is used to describe all the characteristics of the adjacent node. This is equivalent to the PU resource definition in VTAM/NCP.

- Device Description

The Device Description is used to describe all the characteristics of the logical connection between two applications or locations in the network. This is equivalent to an LU definition in VTAM. This descriptor is for dependent or independent LUs.

The AS/400 has a feature called Automatic Configuration. Automatic Configuration can be used to dynamically create Device Descriptions and/or Controller Descriptions on LAN links. The description is generated when a adjacent node of a partner LU attempts to communicate with the AS/400. A Line Description cannot be dynamically defined.

6.3 Prerequisites

OS/400 Version 1.2 provides support for all APPN functions and node types. The border node function is available in OS/400 Version 2.1 and in OS/400 Version 1.3 with PTFs.

If the AS/400 is serving as an intermediate node for the 3174 DLUR and VTAM DLUS, the following PTFs should be applied:

Table 13. PTFs Required for DLUR/DLUS via AS/400 Intermediate Node	
OS/400 Release	PTF Required
Version 2 Release 2	MF07043
Versions 2 Release 3	MF07044
Note: If the PTFs are not applied, you will get a SNA sense code 8004000 in response to a BIND.	

For older versions of OS/400, PTFs are required to support APPN links to the 3174. This is not a comprehensive list.

Table 14. OS/400 APARs for 3174 APPN			
Problem/Symptom	Users Affected	OS/400	
		Release # APAR #	Source Fixed in Release #
Unable to start independent session with AS/400 application.	Users with a shared (combined 2.0/2.1) link between AS/400 and 3174.	V1.2, V1.3, V2.1 MA03632, MA03636	V2.1.1
OS/400 message CPI5906 received. APPN CP-CP session terminating with reason code '0E'.	All users starting CP-CP sessions with OS/400.	V1.2, V1.3 MA02267, MA03302	V2.1
OS/400 message CPI5906 received. APPN CP-CP session terminating with reason code '0E'.	All users starting CP-CP sessions with OS/400 and issuing directory searches and topology updates.	V1.3 MA03718	V2.1

Chapter 7. Personal Systems/2 Considerations

Depending upon the software, the PS/2 can participate in an APPN network as an APPN node or LEN end node. The some common connections through the 3174 are the traditional IBM APPC/APPN products:

- Communications Manager/2
- DCAF
- PC Support for the AS/400
- NetView DM/2
- Personal Communications family

The scenarios used in this document will cover using the applicable above mentioned products in an OS/2, DOS and Microsoft Windows Version 3.x environment communicating via the 3174 to an AS/400 or Subarea VTAM applications.

When attaching to the 3174, the transport protocol used between the PS/2 and the 3174 APPN network node can be either local area network or 3174 Peer Communications. See Chapter 2, "3174 Peer Communication with APPN" on page 57 for details on the software and hardware required for 3174 Peer Communications connections.

7.1 Communications Manager/2 Considerations

Communications Manager/2 is the most popularly used Personal Systems/2 APPC/APPN software used in the scenarios throughout this document. Communications Manager/2 can appear as an APPN node or a LEN end node. It combines the APPC functions of Extended Services-Communications Manager and the APPN routing of Networking Services/2.

Communications Manager/2 provides an 5250 emulation functions for communicating with the AS/400 as well as an APPC and CPI-C API interface for user-developed or product applications. Products such as Distributed Console Access Facility (DCAF) and NetView DM/2 utilize the CM/2 APPC/APPN subsystem.

7.2 NetView DM/2

NetView Distribution Manager/2 is supported when using 3174 Configuration Support-C LIC, but Configuration Support-B CSCM is not supported because an LU 6.2 session is required by NetView Distribution Manager/2.

7.3 Distributed Console Access Facility

Distributed Console Access Facility, commonly called DCAF, gives you the ability to remotely take over control of the keyboard and display of a workstation. NetBIOS or LU 6.2 sessions exist between the target and controlling workstations.

7.4 Personal Communications

The Personal Communications family of products, provides 3270, 5250 and gateway emulations for programmable workstations running DOS, Microsoft Windows Version 3.x, and OS/2 operating systems. Currently, a workstation running Personal Communications is always a LEN node.

When using the combined product Personal Communications AS/400 and 3270 Version 4.0 for Windows, two separate links are always established. This is regardless of whether the destination MAC address is the same for both 3270 and 5250 emulation sessions and/or there are multiple adapters in the workstations. When a single adapter is used, a dedicated SAP must be used for each link, since the LAA is the same for both links.

Chapter 8. 3174 NN with VTAM APPN Nodes (Token-Ring)

The objective of this configuration is to introduce the capability of the 3174 to act as an NN within the APPN/Subarea environments introduced in VTAM Version 4 Release 1. The 3174 is running Configuration Support-C3. The scenario also includes the ability to have a shared link between the host and the 3174.

Detailed VTAM and NCP definitions for Subarea/APPN have been provided and should be used as prototypes for host definitions for the remaining scenarios.

Figure 54 illustrates the test configuration.

8.1 Configuration

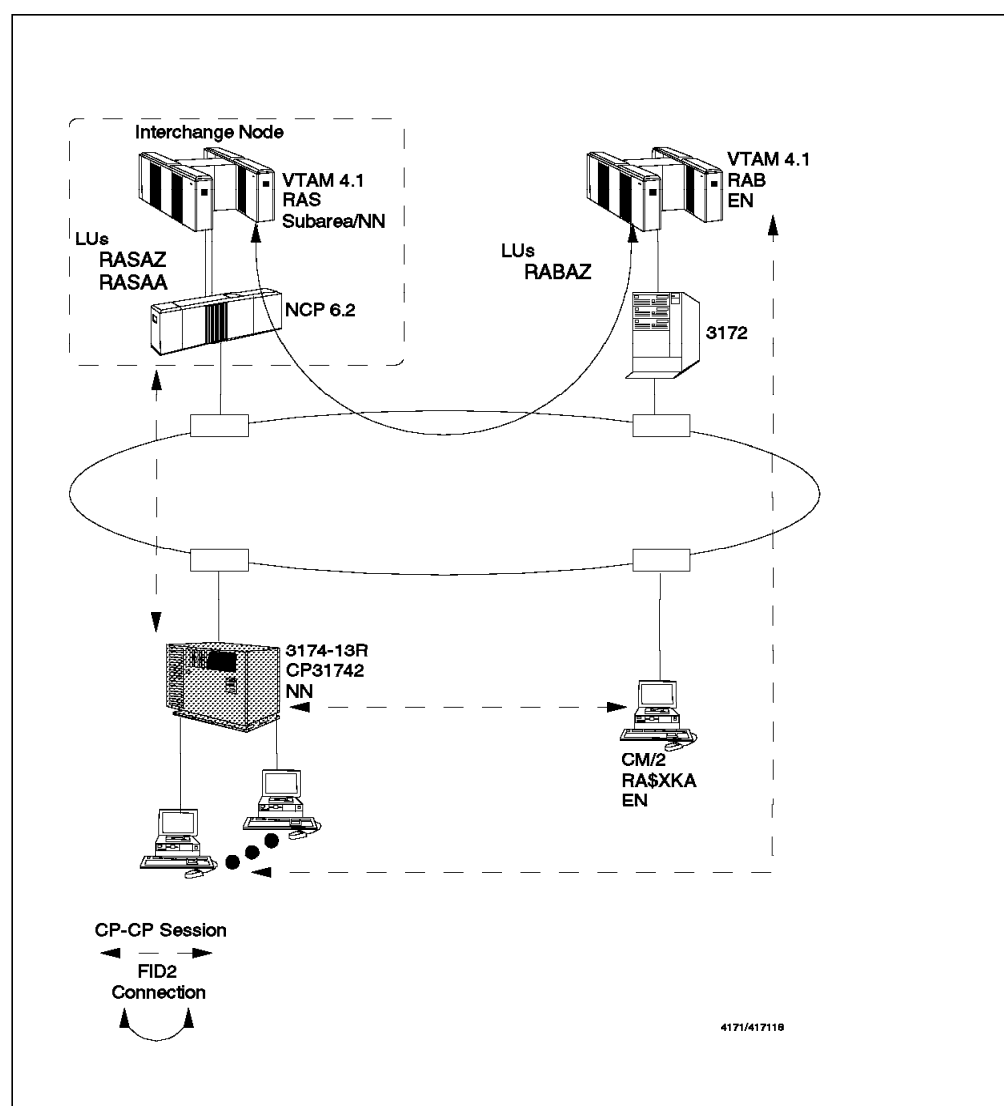


Figure 54. 3174 NN with VTAM/APPN over Token-Ring

8.2 Definition Overview

Please note the following for this configuration:

- VTAM ICN (CP name RAS) contains applications RASAZ and RASAA
- VTAM EN (CP name RAB) contains an application RABAZ.
- 3174-13R configured as an APPN NN (CP name CP31742). The 3174 also has some coax-attached dependent LUs defined (RA74LUB to RA74LUE), thus the link to the host is shared.
- PS/2 EN (CP name RA\$XKA) will establish only a CP-CP session during this test.
- CP31742 is the Network Node Server (NNS) for both RAB and RA\$XKA.
- Between RAS and RAB there is also a FID2 link.

8.3 VTAM and NCP Definitions

For this scenario we will need to do the following for the host systems:

- Define the switched major node for link to 3174 (CP31742).

Figure 55 shows the switched network major node definition used for activating a link from RAS to the 3174 (RAS74SW).

- Define the 3174 as the primary network node server for RAB.

See Figure 56 on page 121.

- Define the Applications to VTAM

8.3.1 3174 Switched Major Node

```
*****
* 3174 SWNET FOR RAS - 3174 T2.1 CONNECTION (RAS74SW) *
*****
RAS74SW VBUILD TYPE=SWNET,MAXNO=1,MAXGRP=1
CP3174P PU 2 ADDR=01,PUTYPE=2,MAXPATH=1,DWACT=YES,CPNAME=CP31742, 1 X
MODETAB=AMODETAB,DLOGMOD=M2SDLCQ,USSTAB=US327X,DYNLU=YES
PATH74A PATH DIALNO=0004400031740002,GRPNM=EG09L01,CALL=INOUT
RA74LUB LU LOCADDR=2
RA74LUC LU LOCADDR=3
RA74LUD LU LOCADDR=4
RA74LUE LU LOCADDR=5
```

Figure 55. The Switched Major Node Used for RAS - 3174 Connection

1 This is the CPNAME or the 3174 (CP31742). CPNAME must be the same as that given during the 3174 customization Question 511.

2 CP3174P is the node T2.0 PU name for the dependent LUs.

The link to RAS is a shared T2.0/2.1 link (supports both T2.0 and T2.1 traffic). After a successful XID exchange, RAS is going to establish SSCP-PU and SSCP-LU sessions to these dependent LUs.

8.3.2 RAB's Network Node Server

CP31742 is defined as the primary network node server for RAB. The configuration is valid although it is probably not the most common.

Figure 56 shows the network node server list used in RAB.

```
*****
*      NETWORK NODE SERVER LIST FOR RAB (SERVERI)      *
*****
          VBUILD TYPE=NETSRVR
CP31742  NETSRVR SLUINIT=OPT 1
RAS      NETSRVR
```

Figure 56. The Network Node Server List for RAB

Because it is unable to allow SLU-initiated sessions, the SLUINIT=OPT is defined for CP31742 1.

8.3.3 Host Applications

RABAZ

```
RABZ      VBUILD TYPE=APPL
RABAZ     APPL ACBNAME=RABAZ,APPC=YES,AUTOSSES=5,DDRAINL=NALLOW,      X
          DMINWNL=3,DMINWNR=6,DRESPL=NALLOW,DSESLIM=9,EAS=509,      X
          MODETAB=KEIJO,SECAPT=CONV,VPACING=2,VERIFY=NONE,          X
          SRBEXIT=YES,DLOGMOD=COSSUA
```

Figure 57. VBUILD for RABAZ

RASAZ

```
RASAPPC   VBUILD TYPE=APPL
RASAZ     APPL ACBNAME=RASAZ,APPC=YES,AUTOSSES=5,DDRAINL=NALLOW,      X
          DMINWNL=3,DMINWNR=6,DRESPL=NALLOW,DSESLIM=9,EAS=509,      X
          MODETAB=APPCMODE,SECAPT=CONV,VPACING=2,VERIFY=NONE,        X
          SRBEXIT=YES,DLOGMOD=#INTER
```

Figure 58. VBUILD for RASAZ

RASAA

```
          VBUILD TYPE=APPL
*****
** 1 VTAM APPL STATEMENT FOR THE SNAMEs VTAM APPLICATION          *
*****
RASAA     APPL ACBNAME=RASAA,PRTCT=SECRET,AUTH=(ACQ,PASS,NVSPACE)
```

Figure 59. VBUILD for RASAA

8.3.4 VTAM Start Options

We have now the start options for RAS and RAB VTAMs. Remember that RAS is an ICN (Interchange Node). This means that it is defined as both an APPN and subarea node.

Figure 60 show the start options we used for RAB and Figure 61 show the start options we used for RAS.

SSCPID=11,	X
CONFIG=B1,SUPP=NOSUP,CMPVTAM=0,	X
NETID=USIBMRA,HOSTPU=ISTPUS11,HOSTSA=11,SSCPNAME=RAB, 1	X
GWSSCP=NO,DYNASSCP=YES,XNETALS=YES,	X
SSCPDYN=YES,SSCPORD=PRIORITY,DYNLU=YES, 2	X
NOTRACE,TYPE=VTAM,IOINT=0,	X
CSALIMIT=0,	X
TNSTAT,CNSL,IOPURGE=5M,	X
PPOLOG=YES,	X
ASYDE=TERM,	X
IOBUF=(400,182,3,,1,58),	X
LPBUF=(24,,2,,1,4),	X
LFBUF=(,,1,1),	X
CRPLBUF=(400,,,1,4),	X
SFBUF=(,,1,1)	X
CPCP=YES, 3	X
NODETYPE=EN 4	

Figure 60. Start Options to RAB

- 1 SSCPNAME (CP Name) for **RAB** and **RAS**
- 2 Dynamic LU are supported
- 3 CP-CP session is requested
- 4 Node type for **RAB** is End Node and the node type for **RAS** is Network Node.
- 5 **RAS** is an ICN, so SUBAREA required

SSCPID=28,GWSSCP=YES,	X
HOSTSA=28,	X
CONFIG=S0,SUPP=NOSUP,	X
NETID=USIBMRA,HOSTPU=ISTPUS28,SSCPNAME=RAS, 1	X
NOTRACE,TYPE=VTAM,IOINT=0,	X
NCPBUFSZ=2048,	X
PPOLOG=YES,DYNLU=YES, 2	X
XNETALS=YES,	X
CSALIMIT=0,	X
IOBUF=(230,256,3,,1,38),	X
LPBUF=(24,,2,,1,4),	X
LFBUF=(,,1,1),	X
CRPLBUF=(180,,,1,4),	X
SFBUF=(,,1,1)	X
CPCP=YES, 3	X
NODETYPE=NN 4	X
SUBAREA=YES 5	

Figure 61. Start Options to RAS

8.4 3174-11L Definitions

The 3174 customization panels related to APPN are shown from Figure 62 below to Figure 65 on page 124.

8.4.1 Enabling 3174 APPN

```
Common SNA 00/B00

500 - 0      4 501 - USIBMRA      502 - 

APPN Support Fields:

1 510 - 1      2 511 - CP31742_  3 512 - CNET_

PF: 3=Quit  4=Default  7=Back  8=Fwd  9=RtnH
```

Figure 62. 3174 Common SNA Questions

- 1** APPN is enabled (510=1).
- 2** The APPN control point name is CP31742.
- 3** The virtual network node name of APPN is CNET. A name must be given in order to continue the customization.
- 4** The Network ID (NETID) for the APPN network is USIBMRA. This will be the default NETID for all LEN nodes with links to CP31742.

8.4.2 Defining 3174 APPN Resources

Defining Local Node Resources

```
APPN Node Definition

1 610 SESSIONS - 1      2 611 NODES/LINKS - 1
3 612 WILDCARD - 0      613 HOST LINK - 1A

PF: 3=Quit  4=Default  8=Fwd
```

Figure 63. 3174 APPN Node Definition Questions

- 1** Up to 225 sessions may be activated through the 3174.
- 2** Up to 20 nodes/links are supported by the 3174.
- 3** Wildcard routes are not required since the VTAM is an APPN node (612=0).

Defining Adjacent Network Resources

Network Resources							001 of 240
CPNAME	NODE	TYPE	LUS*	DLC	TYPE**	ADDRESS**	
	1-4		X		1-3		
1	1 RAB	2	X	1		4000 5001 3172 04	
2	2 RAS	3	-	-			
3	3 RA\$XKA	2	-	-			
4		-	-	-			
5		-	-	-			
6		-	-	-			
7		-	-	-			
8		-	-	-			
9		-	-	-			
10		-	-	-			
11		-	-	-			
12		-	-	-			

* - Enter 'X' to define Associated LUs where required.
 ** - Specify only for connect initiation from this 3174.

PF: 3=Quit 4=Default 7=Back 8=Fwd 11=PageFwd

Figure 64. 3174 Network Resource Definitions

All the CP names of those adjacent nodes that are going to establish CP-CP sessions with this 3174 must be defined in the network resources list. For those links that are going to be activated by this 3174 the destination address must also be defined. In our case, we are defining the links to both VTAM APPN nodes (RAB and RAS) and the PS/2 EN (RA\$XKA). The 3174 will attempt to initiate the link (DLC TYPE and ADDRESS specified) between node RAB and itself.

1 RAB is defined as an EN (Node Type 2). Connection is going to be initiated by the 3174.

2 RAS is defined as an NN (Node Type 3).

3 RA\$XKA is defined as an EN to allocate resources for future connectivity.

Associated LUs: RAB also has associated LUs defined. The definition for the associated LUs is optional and it is used to reduce the number of LU searches. In our case we are using the generic naming (partial wildcard), first introduced in Configuration Support-C3.

Associated LUs					
CPNAME	LUNAME	LUNAME	LUNAME	LUNAME	SERVING NODE
1 RAB	RAB* 1				2 CP31742

PF: 3=Quit 7=Back 12=Test Menu

Figure 65. Associated LUs

1 The generic name for LUs associated with host RAB is RAB*.

2 The 3174 is the network node server for RAB.

8.5 Activation and Verification of the Configuration

Once the switched major node is activated from NetView, the configuration can be verified using NetView and/or the 3174 Online Tests 17. We show the configuration through the eyes of NetView and the 3174 Online Test 17,2 (adjacent nodes).

Figure 66 shows the activation of the link from RAS to the 3174.

```
VARY NET,ACT,ID=RAS74SW
IST097I  VARY      ACCEPTED
IST1132I  CP3174P      IS ACTIVE, TYPE = PU_T2      1
IST1132I  RAS74SW      IS ACTIVE, TYPE = SW_SNA MAJ NODE
IST590I  CONNECTOUT ESTABLISHED FOR PU CP3174P  ON LINE J0009015
IST1086I  APPN CONNECTION FOR USIBMRA.CP31742  IS ACTIVE - TGN = 21
IST1096I  CP-CP SESSIONS WITH USIBMRA.CP31742  ACTIVATED  2

DIS RAS74SW
DISPLAY NET,ID=RAS74SW,SCOPE=ALL
IST097I  DISPLAY  ACCEPTED
IST075I  NAME = RAS74SW      , TYPE = SW_SNA MAJ NODE
IST486I  STATUS= ACTIV      , DESIRED STATE= ACTIV
IST084I  NETWORK NODES:
IST089I  CP3174P  TYPE = PHYSICAL UNIT      , ACTIV--L--
IST089I  RA74LUB  TYPE = LOGICAL UNIT      , ACTIV      3
IST089I  RA74LUC  TYPE = LOGICAL UNIT      , ACTIV
IST089I  RA74LUD  TYPE = LOGICAL UNIT      , ACTIV
IST089I  RA74LUE  TYPE = LOGICAL UNIT      , ACTIV
```

Figure 66. The Link Activation from RAS to 3174

After the activation of the RAS74SW major node:

- The PU for the dependent LUs is active **1**.
- The CP-CP session between RAS and CP31742 is established **2**.

The display command for RAS74SW shows that the defined dependent LUs are also active **3**.

The NLDM display is used to verify that both CP-CP sessions between RAS and CP31742 are active. Figure 67 shows the NLDM session list of CP31742.

```
NLDM.SESS                                PAGE 1
                                SESSION LIST
NAME: CP31742                                DOMAIN: RASAN
-----
***** PRIMARY ***** ***** SECONDARY *****
SEL#  NAME  TYPE  DOM  NAME  TYPE  DOM  START TIME  END TIME
( 1)  RAS   LU   RASAN CP31742 ILU  RASAN 01/07 23:34:29 *** ACTIVE ***
( 2)  CP31742 ILU  RASAN RAS    LU   RASAN 01/07 23:34:29 *** ACTIVE ***

END OF DATA
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)
```

Figure 67. The NLDM List of Sessions Between RAS and CP31742

The D NET,NETSRVR command in RAB is used in Figure 68 to clarify the current network node server of RAB.

```

NCCF                                N E T V I E W    RABAN                01/07/93 23:35:46
* RABAN    D NET,NETSRVR
  RABAN    IST097I  DISPLAY  ACCEPTED
' RABAN
IST350I  DISPLAY TYPE = NETWORK NODE SERVER LIST
IST1252I  DEFINED NETWORK NODE SERVER LIST, NAME = RABNSRV
IST1253I  USIBMRA.CP31742      SLUINIT = OPT
IST1253I  USIBMRA.RAS          SLUINIT = REQ
IST924I  -----
IST1254I  SERVER LIST PROCESSED ORDER = FIRST
IST924I  -----
IST1255I  OTHER NETWORK NODES ALLOWED AS SERVERS
IST1253I  NONE
IST924I  -----
IST1256I  CURRENT NETWORK NODE SERVER
IST1253I  USIBMRA.CP31742      SLUINIT = OPT
IST314I  END
-----

```

Figure 68. D NET, NETSRVR Command Issued from RAB

The display shows that CP31742 is the current network node server. This is because:

- RAB and its MAC address are defined for the 3174 during the customization.
- The node netserver list (SERVERI) is activated by RAB.
- The link from RAS to RAB is not active.

After IML, the 3174 keeps trying to activate a link to all the network nodes defined in the network resources list. In order to guarantee that CP31742 will become the network node server (NNS) for RAB it is important that the link from RAS to RAB not be active before the 3174 has been IMLed. The network node server list is the list of the only valid candidates and does not force CP31742 as network node server (NNS) for RAB.

Figure 69 shows the topology database information from CP31742. This can be seen after TDUs have flowed between RAS and CP31742 by using the D NET,TOPO command from RAS.

```

NCCF                                N E T V I E W    RASAN KEIJO          01/07/93 23:47:32
* RASAN    D NET,TOPO,ID=CP31742,LIST=ALL
  RASAN    IST097I  DISPLAY  ACCEPTED
' RASAN
IST350I  DISPLAY TYPE = TOPOLOGY
IST1295I  CP NAME      NODETYPE  ROUTERES  CONGESTION  CP-CP WEIGHT
IST1296I  USIBMRA.CP31742 1  NN      128      NONE          *NA*  *NA*
IST1297I                                ICN/MDH  CDSERV  RSN          BASEWEIGHT
IST1298I                                NO      NO      4            *NA*
IST1299I  TRANSMISSION GROUPS ORIGINATING AT CP USIBMRA.CP31742
IST1357I  CPCP
IST1300I  DESTINATION CP  TGN      STATUS  TGTYPE  VALUE  WEIGHT
IST1301I  USIBMRA.CNET    0  5  OPER  INTERM  YES    *NA*
IST1301I  USIBMRA.RAS     21  2  OPER  INTERM  YES    *NA*
IST1301I  USIBMRA.RAB     21  3  OPER  ENDPT   YES    *NA*
IST1301I  USIBMRA.RA$XKA  21  4  OPER  ENDPT   YES    *NA*
IST314I  END

```

Figure 69. Topology Information of CP31742

In the display it can be seen that CP31742 is a NN **1**. It has operative TGs to RAS **2** and RAB **3** and RA\$XKA **4** has activated a link to CP31742. The virtual network CNET can also be seen in this display **5**. Its TGN is 0.

8.5.1 The Dependent LU and Independent LU Sessions

The dependent LU session between RA74LUB and RASAA and the LU 6.2 sessions between RASAZ and RABAZ are established, in order to show that the 3174 can both serve independent LUs as an NN and own dependent LUs.

The information found in Figure 70 to Figure 72 on page 128 are used to verify the dependent LU and independent LU sessions.

NLDM.SESS							PAGE 1	
SESSION LIST								
NAME: RA74LUB							DOMAIN: RASAN	

***** PRIMARY *****			***** SECONDARY *****					
SEL#	NAME	TYPE	DOM	NAME	TYPE	DOM	START TIME	END TIME
(1)	RASAA	LU	RASAN	RA74LUB	LU	RASAN	01/07 23:54:21	*** ACTIVE ***
(2)	RAS	SSCP	RASAN	RA74LUB	LU	RASAN	01/07 23:51:49	*** ACTIVE ***

Figure 70. The NLDM Session List of RA74LUB

Both SSCP-LU and LU-LU sessions are active according to the NLDM session list.

NLDM.CON		SESSION CONFIGURATION DATA				PAGE 1	
-----		PRIMARY -----		+-----		SECONDARY -----	
NAME RASAA	SA 0000001C	EL 0052		NAME RA74LUB	SA 00000009	EL 00D5	
-----		+-----		+-----		-----	
DOMAIN RASAN	PCID USIBMRA.RAS.F627D164422615C6					DOMAIN RASAN	
+-----+		+-----+		+-----+		+-----+	
RAS	CP/SSCP		---		---		
ISTPUS28(0000)	SUBAREA PU				SUBAREA PU		RA9NCPC (0000)
+-----+		SUBA TP 00		+-----+		+-----+	
		VR 00					
		ER 00					
RASAA (0052)	LU		RER 00		LINK		J0009015
+-----+		+-----+		+-----+		+-----+	
		LOGMODE M2SDLCQ		+-----+		+-----+	
				PU		CP3174P	
		1 SADJ CP CP31742		+-----+		+-----+	
				LU		RA74LUB (00D5)	
				+-----+		+-----+	

SELECT PT, ST (PRI, SEC TRACE), RT (RESP TIME), P, ER, VR
CMD==>

Figure 71. The NLDM Session Configuration Data for RA74LUB

1 The NLDM session configuration data shows that CP31742 can be seen as the adjacent CP.

Active Independent LUs

NLDM.SESS							PAGE 1	
SESSION LIST								
NAME: RABAZ							DOMAIN: RASAN	

***** PRIMARY *****			***** SECONDARY *****					
SEL#	NAME	TYPE	DOM	NAME	TYPE	DOM	START TIME	END TIME
(1)	RABAZ	ILU	RASAN	RASAZ	ILU	C-C	01/07 23:36:33	*** ACTIVE ***
(2)	RASAZ	ILU	C-C	RABAZ	ILU	RASAN	01/07 23:36:33	*** ACTIVE ***
(3)	RASAZ	ILU	C-C	RABAZ	ILU	RASAN	01/07 23:36:32	*** ACTIVE ***
(4)	RASAZ	ILU	C-C	RABAZ	ILU	RASAN	01/07 23:36:32	*** ACTIVE ***
(5)	RABAZ	ILU	RASAN	RASAZ	ILU	C-C	01/07 23:36:32	*** ACTIVE ***
(6)	RABAZ	ILU	RASAN	RASAZ	ILU	C-C	01/07 23:36:32	*** ACTIVE ***
ENTER TO VIEW MORE DATA								
ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)								
CMD==>								

Figure 72. The NLDM Session List for RABAZ

The NLDM session list shows six active sessions between RASAZ and RABAZ.

8.5.2 Verification Using 3174 Online Test 17, 2

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP

1 21	USIBMRA	RAS	NN	OPEN	08	2	YES
2 21	USIBMRA	RAB	EN	OPEN	08	2	YES
3 21	USIBMRA	RA\$XKA	EN	OPEN	08	1	YES
To go directly to other tests, enter: /Test,Option							
Select Option; press ENTER ==>							
4729-Enter the LINKID to run Link Status Test							
PF: 3=Quit 5=Refresh 12=Test Menu							

Figure 73. Display of Nodes Adjacent to CP31742 Using Online Test 17,2

- 1** The CP-CP session between RAS and CP31742 is established
- 2** CP-CP session between RAB and CP31742
- 3** CP-CP session between the PS/2 EN with CP name RA\$XKA and the 3174 NN

Chapter 9. 3174 via Shared SDLC Link to an AS/400

This scenario shows the 3174 capability of a shared (T2.0 and T2.1) link to an AS/400. The 3174 is serving as a gateway as well as a network node. Prior to Configuration Support-C3, this scenario was only possible over token-ring. The emphasis is on the support of a hybrid T2.0/T2.1 SDLC link between the AS/400 and the 3174.

The following interesting points should be noted about this scenario:

- The 3174-11R network node server is using the SNA PassThrough capabilities of the AS/400 to access the VTAM.
- The PS/2 LEN node, PS/2 EN, 3174 network nodes and the AS/400 belong to the same network; that is, they use the same network ID: USIBMRAA.
- The host interchange node resides in a different network.
- Type 2.0 and 2.1 traffic are sharing the same logical link.

9.1 Configuration

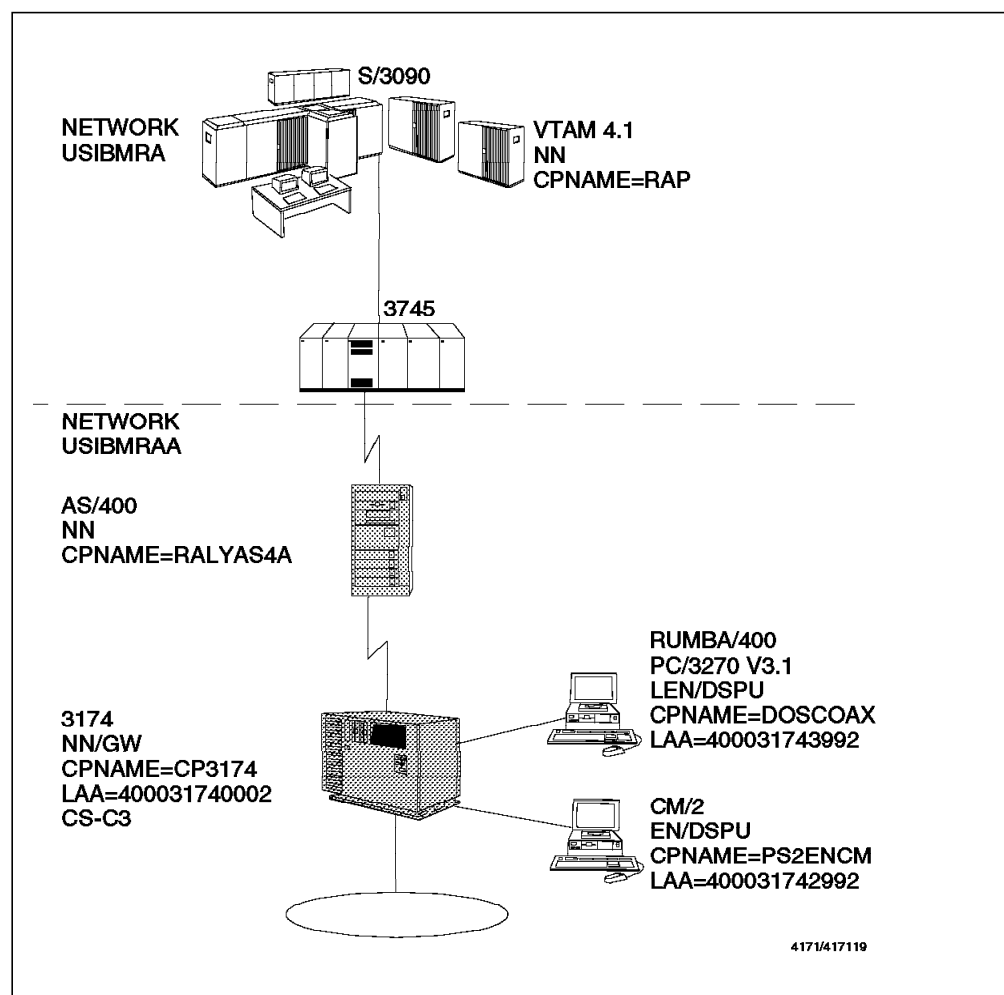


Figure 74. Scenario Configuration

9.2 Definition Overview

This scenario illustrates a PS/2 EN (PSENCM) and a PS/2 LEN (DOSCOAX) physically connected to the 3174-11R over coax using Peer Communications (LAN over coax).

The sample networks have the following components:

Network USIBMRA

- Interchange Node (RAP)
 - An S/370 host with VTAM V4.R1
 - A 3745 with NCP V6.2, channel attached

Network USIBMRAA

- The AS/400 (RALYAS4A) is attached to a 3745 via SDLC link.
- 3174-11R (CP3174) is attached to the AS/400 via SDLC link.
 - APPN NN
 - Token-Ring Gateway
 - Peer Communication (LAN over Coax)
- PS/2 EN CM/2 (PS2ENCM).
 - Communications Manager/2 V1.0
 - 5250 Emulation (T2.1)
 - 3270 Emulation (T2.0)
 - Peer attachment (LAN over Coax)
 - Token-Ring address (400031742992)
- PS/2 LEN EN (DOSCOAX2).
 - Personal Communications/3270 Version 3.1 (T2.0)
 - PC Support/400 and RUMBA/400 (T2.1)
 - Peer attachment (LAN over coax)
 - Token-Ring address (400031743992)

The 3174 network node is taking advantage of the AS/400 border node capabilities. The host interchange node is in a different network than the 3174. The AS/400 is the node that allows communications across the two networks. With 3174 Configuration Support-C5, the AS/400 is no longer required when the 3174 wishes to communicate with an APPN node that is in a different network. Configuration Support-C5 provides the 3174 with border node coexistence. In this scenario, we are running Configuration Support-C3 and VTAM Version 4 Release 1, thus the AS/400 is required.

9.3 VTAM and NCP Definitions

We will start with the subarea. In VTAM/NCP we will do the following:

- Define the physical link between the AS/400 and the subarea.
- Define the 3174 PU and associated dependent LUs.

```

*          LINE MACRO SPECIFICATION          SDLC LINK 014 FOR AS/400
*****
RA9L005 LINE ADDRESS=(005,HALF), HDX LEASED LINE *
        ANS=CONTINUE, DON'T BREAK CROSS DOMAIN SESSIONS *
        NPACOLL=YES, *
        ISTATUS=ACTIVE, *
        CLOCKNG=EXT, MODEM CLOCKING *
        DUPLEX=(FULL), REQUEST TO SEND ALWAYS UP *
        MAXPU=9, ALLOW NO MORE THAN 9 PUS ON LINE *
        SERVLIM=10, *
        SPEED=9600, NPA AND SCANNER USE ### *
        SRT=(,64)
*          NGFTXT='AS/400/A'
*****
*          SERVICE MACRO SPECIFICATION FOR SDLC (LINE 005) *
*****
        SERVICE ORDER=(RA9P05),MAXLIST=9
*****
*          PU AND LU DEFINITIONS OF AS/400A TO SUPPORT DEPENDENT
*          AND INDEPENDENT LUS
*****
RA9P05 PU ADDR=01, AS/400 SDLC ADDRESS *
        MAXDATA=265, MAXIMUM FRAME SIZE *
        MAXOUT=7, MAX SDLC FRAMES BEFORE RESPONSE *
        PACING=0, PACING SET BY BIND IMAGE *
        PASSLIM=8, *
        PUTYPE=2, *
        RETRIES=(,4,5), 7 RETRY PER SECOND FOR 5 TIMES *
        XID=YES, FOR T2.1 PU *
        DYNLU=YES, DYNAMIC LU *
        DISCNT=(NO), (V) VTAM *
        MODETAB=MTGS3X, (V) VTAM *
        ISTATUS=ACTIVE, (V) VTAM *
        SSCPFM=USSSCS, (V) VTAM *
        USSTAB=US327X, (V) VTAM *
        VPACING=0, (V) VTAM *
*          STATOPT='AS/400 A'
RA9T0500 LU RESSCB=4, INDEPENDENT LU *
        LOCADDR=0, *
        ISTATUS=ACTIVE
*          STATOPT='INDEPENDENT LU'
RA9T0501 LU LOCADDR=1, 3270 EMULATION *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
RA9T0502 LU LOCADDR=2, 3270 EMULATION *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
RA9T0503 LU LOCADDR=3, 3270 EMULATION *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
RA9T0504 LU LOCADDR=4, 3270 EMULATION *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
*-----
RA9T0505 LU LOCADDR=5, 3270 EMULATION SNA PT *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
RA9T0506 LU LOCADDR=6, 3270 EMULATION SNA PT *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE
RA9T0507 LU LOCADDR=7, 3270 EMULATION SNA PT *
        MODETAB=MTGS3X, *
        USSTAB=US327X, *
        DLOGMOD=EM3277, *
        ISTATUS=ACTIVE

```

Figure 75. NCP/VTAM Line, PU and LU Definition to the AS/400

9.4 AS/400 Definitions

On the AS/400, we do the following:

- Define the physical line (Line Description)
- Specify the AS/400 network ID and control point name (Network Attributes)
- Define the AS/400 node type (Network Attributes)
- Define the local LU name (Device Description)
- Define the connection from the AS/400 to the 3174-11R (Controller Description)

Defining the controller description is not necessary if you specify Autocreate Controller :*Yes on the AS/400 Line Description of a LAN (token-ring and Ethernet) connection and the adjacent node is capable of initiating the link. In the case of a LAN, you would consider explicitly defining the controller if you wanted to have control over the controller naming convention. Since the links we are using are SDLC, we will have to explicitly define the controller.

9.4.1 Network Attributes for RALYAS4A

```
Display Network Attributes
System:  RALYAS4A
Current system name . . . . . : RALYAS4A
Pending system name . . . . . :
Local network ID . . . . . : 1 USIBMRAA
Local control point name . . . . . : 2 RALYAS4A
Default local location . . . . . : 3 RALYAS4A
Default mode . . . . . : BLANK
APPN node type . . . . . : 4 *NETNODE
Maximum number of intermediate sessions . . . . : 200
Route addition resistance . . . . . : 128
Server network ID/control point name . . . . . :
```

Figure 76. Network Attributes of the AS/400 (RALYAS4A)

1 The network ID for the APPN network is USIBMRAA. This must match the network ID supplied in 3174 customization Question 501, when using Configuration Support-C4 and earlier. This restriction has been removed with border node coexistence in Configuration Support-C5.

2 The control point name of the AS/400 is defined as RALYAS4A.

3 The local LU name of the AS/400 is same as the CP name.

4 The AS/400 is a Network Node (*NETNODE).

9.4.2 Line Description to the 3174

Display Line Description		R
		05/07/93 1
Line description	LIN3174C3	
Option	*BASIC	
Category of line	*SDLC	
Resource names	LIN061	
Online at IPL	*NO	
Data link role	*PRI	
Physical interface	*RS232V24	
Connection type	*MP	
Switched network backup	*NO	
Exchange identifier	05615078	
NRZI data encoding	*YES	
Maximum controllers	4	
Clocking	*MODEM	
Line speed	9600	
Modem type supported	*NORMAL	
Modem data rate select	*HALF	
Autoanswer type	*DTR	
Maximum frame size	521	
Error threshold level	*OFF	
Duplex	*FULL	
Modulus	8	
Text	LIN061 Line to 3174 with C3	

Figure 77. Line Description to CP3174 (LIN3174C3)

The definition for the leased SDLC line between the 3174 and the AS/400 is shown in Figure 77.

9.4.3 Controller Description for CP3174

Now that we have the line defined, we must define the node at the other end of the node. To do this we have created a controller description for the 3174 as displayed in Figure 78.

Display Controller Description		R
		05/07/93 1
Controller description	CTL3174C3M	
Option	*BASIC	
Category of controller	*APPC	
Link type	*SDLC	
Online at IPL	*NO	
Switched connection	*NO	
Switched network backup	*NO	
Attached nonswitched line	LIN3174C3	
Character code	*EBCDIC	
Maximum frame size	521	
Remote network identifier	*NETATR	
Remote control point	1 CP3174	
Data link role	*NEG	
Station address	2 C1	
Text	SDLC CTL for 3174 NN using C3	
APPN-capable	3 *YES	
APPN CP session support	4 *YES	
APPN node type	5 *CALC	
APPN transmission group number	6 1	
Autodelete device	1440	
User-defined 1	*LIND	
User-defined 2	*LIND	
User-defined 3	*LIND	

Figure 78. Controller Description for CP3174 (CTL3174C3M)

- 1** This is the control point name (CP name) of the 3174 (CP3174).
- 2** The SDLC address of C1 matches the value defined in 3174 customization Question 102.
- 3** The 3174 is APPN-capable, meaning that an XID3 for a T2.1 node can be sent or expected from the 3174.
- 4** A CP-CP session is desired between the 3174 NN and the AS/400 NN.
- 5** The 3174 APPN node type is to be learned during the XID exchange (APPN node type of *CALC).
- 6** The transmission group for the link between the 3174 and the AS/400 will default to 1.

9.4.4 Device Description for CP3174 Dependent LUs

Since the 3174 has devices directly attached that required a 3270 dependent sessions (T2.0), device descriptions have been created to utilize the SNA PassThrough function of the AS/400 to access applications defined at the S/370 host.

DEV3174C3M - SNA PassThrough Device

Display Device Description		05/07/93
Device description	DEV3174C3M	
Option	*BASIC	
Category of device	*DSP	
Device class	1 *SNPT	
Device type	2 3279	
Device model	0	
Local location address	3 02	
Online at IPL	*NO	
Attached controller	4 CTL3174C3M	
Keyboard language type	USB	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSPRT	
Library	*LIBL	
Inactivity timer	*NOMAX	
SNA pass-through device desc	RA9T0507	
SNA pass-through group name	*NONE	
Host signon/logon command	*NONE	

Figure 79. Device Description Coax-Attached Terminal (DEV3174C3M)

- 1** *SNPT indicates that the Device class is a SNA PassThrough device.
- 2** Since the device (LU) is for a display session we have set the Device type to 3279.
- 3** The LOCADDR in VTAM for this LU (device) is 02 and 03, respectively.
- 4** These devices are defined to controller(PU) CTL3174C3M.

DEV3174C33 - SNA PassThrough Device

Display Device Description		R
		05/07/93 1
Device description	DEV3174C33	
Option	*BASIC	
Category of device	*DSP	
Device class	1 *SNPT	
Device type	2 3279	
Device model	0	
Local location address	3 03	
Online at IPL	*NO	
Attached controller	4 CTL3174C3M	
Keyboard language type	USB	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSPRT	
Library	*LIBL	
Activation timer	170	
Inactivity timer	*NOMAX	
SNA pass-through device desc	RA9T0506	
SNA pass-through group name	*NONE	
Host signon/logon command	*NONE	

Figure 80. Device Description Coax-Attached Terminal (DEV3174C33)

9.4.5 Device Descriptions 5250 ILUs

The EN (PS2ENCM) and the LEN (DOSCOAX2) are customized for a 5250 emulation session to the AS/400. Since these are independent LU 6.2 (APPC) devices, they are created automatically. PS2ENCM is using the 5250 integrated emulator of Communications Manager/2, while DOSCOAX is using the routing support and WSF function of PC Support/400 with a RUMBA interface.

PS2ENCM - Independent Device

Display Device Description			R
		05/07/93	1
Device description	PS2ENCM		
Option	*BASIC		
Category of device	*APPC		
Automatically created	YES		
Remote location	PS2ENCM		
Online at IPL	*NO		
Local location	RALYAS4A		
Remote network identifier	*NETATR		
Attached controller	CTL3174C3M		
Message queue	QSYSOPR		
Library	*LIBL		
Local location address	00		
APPN-capable	*YES		
Single session:			
Single session capable	*NO		
Text	AUTOMATICALLY CREATED BY QLUS		

Figure 81. Device Description for 5250 ILU (PS2ENCM)

DOSCOAX2 - Independent Device

Display Device Description			R
		05/07/93	1
Device description	DOSCOAX2		
Option	*BASIC		
Category of device	*APPC		
Automatically created	YES		
Remote location	DOSCOAX2		
Online at IPL	*NO		
Local location	RALYAS4A		
Remote network identifier	*NETATR		
Attached controller	CTL3174C3M		
Message queue	QSYSOPR		
Library	*LIBL		
Local location address	00		
APPN-capable	*YES		
Single session:			
Single session capable	*NO		
Text	AUTOMATICALLY CREATED BY QLUS		

Figure 82. Device Description for 5250 ILU (DOSCOAX2)

CP 3174 SNASVCMG Session - Independent device: An additional device is automatically created for the purpose of the SNASVCMG session between the 3174 NN and the AS/400.

Display Device Description		R
		05/07/93 1
Device description	CP317400	
Option	*BASIC	
Category of device	*APPC	
Automatically created	YES	
Remote location	CP3174	
Online at IPL	*NO	
Local location	RALYAS4A	
Remote network identifier	*NETATR	
Attached controller	CTL3174C3M	
Message queue	QSYSOPR	
Library	*LIBL	
Local location address	00	
APPN-capable	*YES	
Single session:		
Single session capable	*NO	
Text	AUTOMATICALLY CREATED BY QLUS	

Figure 83. Device Description for SNASVCMG ILU (CP317400)

9.4.6 Descriptions for 3174 Gateway DSPUs

The 3174-11R in this scenario doubles as an APPN network node and as a host gateway. In order to service the DSPUs through the AS/400, there must be a remote workstations (*RWS) defined with associated displays (*DSP) for each DSPU. The 3174 gateway used in this scenario serves several DSPUs (see Figure 96 on page 143). We are showing only the definitions for the Peer Communications (LAN over coax) attached DSPUs.

Controller Description (CTLDOSCOAX2)

Display Controller Description		R
		05/07/93 1
Controller description	CTLDOSCOAX2	
Option	*BASIC	
Category of controller	*RWS	
Controller type	3174	
Controller model	0	
Link type	*SDLC	
Online at IPL	*YES	
Switched connection	*NO	
Switched network backup	*NO	
Attached nonswitched line	LIN3174C3	
Character code	*EBCDIC	
Maximum frame size	265	
SSCP identifier	050000000000	
Station address	C3	
Text	*BLANK	

Figure 84. Controller Description for DSPU PC/3270 (CTLDOSCOAX2)

Device Description (DEVDOSCOAX2)

Display Device Description		05/07/93
Device description	DEVDOSCOAX2	
Option	*BASIC	
Category of device	*DSP	
Device class	*RMT	
Device type	3279	
Device model	0	
Local location address	02	
Online at IPL	*YES	
Attached controller	CTLDOSCOAX2	
Keyboard language type	USB	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSPRT	
Library	*LIBL	
Text	*BLANK	

Figure 85. Device Description for 3270 Session (DEVDOSCOAX2)

Controller Description (CTLPS2ENCM)

Display Controller Description		R
		05/07/93 1
Controller description	CTLPS2ENCM	
Option	*BASIC	
Category of controller	*RWS	
Controller type	3174	
Controller model	0	
Link type	*SDLC	
Online at IPL	*YES	
Switched connection	*NO	
Switched network backup	*NO	
Attached nonswitched line	LIN3174C3	
Character code	*EBCDIC	
Maximum frame size	265	
SSCP identifier	050000000000	
Station address	C5	
Text	*BLANK	

Figure 86. Controller Description for DSPU CM/2 (CTLPS2ENCM)

Device Description (DEVPS2ENCM)

Display Device Description		05/07/93
Device description	DEVPS2ENCM	
Option	*BASIC	
Category of device	*DSP	
Device class	*RMT	
Device type	3279	
Device model	0	
Local location address	02	
Online at IPL	*YES	
Attached controller	CTLPS2ENCM	
Keyboard language type	USB	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSPRT	
Library	*LIBL	
Text	*BLANK	

Figure 87. Device Description for 3270 Session (DEVPS2ENCM)

9.4.7 Descriptions for Host Connection

Since the link to the host is a leased SDLC line and the controller is not an APPC controller, the line controller and dependent devices are explicitly defined versus being created automatically.

Line Description (RA9L005)

Display Line Description		05/07/93	R 1
Line description	RA9L005		
Option	*BASIC		
Category of line	*SDLC		
Resource names	LIN082		
Online at IPL	*NO		
Data link role	*NEG		
Physical interface	*RS232V24		
Connection type	*NONSWTPP		
Switched network backup	*NO		
Exchange identifier	0569406A		
NRZI data encoding	*YES		
Maximum controllers	1		
Clocking	*MODEM		
Line speed	9600		
Modem type supported	*NORMAL		
Modem data rate select	*FULL		
Autoanswer type	*DTR		
Maximum frame size	521		
Error threshold level	*OFF		
Duplex	*HALF		
Modulus	8		
Text	SDLC from RA9NCPM to AS/400		

Figure 88. SDLC Line Description to the Host (RA9L005)

Controller Description (RA9P05)

Display Controller Description		05/07/93	R 1
Controller description	RA9P05		
Option	*BASIC		
Category of controller	*HOST		
Link type	*SDLC		
Online at IPL	*NO		
Switched connection	*NO		
Switched network backup	*NO		
Attached nonswitched line	RA9L005		
Character code	*EBCDIC		
Maximum frame size	521		
Remote network identifier	USIBMRA		
Remote control point	RAP		
SSCP identifier	050000000000		
Local exchange identifier	*LIND		
Station address	01		
Text	HOST CTL - NCP RA9NCPM		
APPN-capable	*YES		
APPN CP session support	*YES		
APPN node type	*CALC		
APPN transmission group number	1		
Autodelete device	1440		
User-defined 1	*LIND		
User-defined 2	*LIND		
User-defined 3	*LIND		

Figure 89. Controller Description (RA9P05)

9.4.8 Device Description for Host Dependent LUs

In 9.4.4, “Device Description for CP3174 Dependent LUs” on page 135 we defined the AS/400 downstream device descriptions for the SNA PassThrough session between the 3174 and the AS/400. We must now define the SNA PassThrough device up to the host.

RA9T0506 - SNA PassThrough Upstream Device Description

Display Device Description		R
		05/07/93 1
Device description	RA9T0506	
Option	*BASIC	
Category of device	*SNPT	
Local location address	06	
SNA pass-through class	*UP	
Online at IPL	*NO	
Attached controller	RA9P05	
Activation timer	170	
SNA pass-through device desc	DEV3174C33	
SNA pass-through group name	*NONE	
Text	SNA PT DEV UPSTREAM DEFINITION	

Figure 90. Upstream SNA Pass through Device Description (RA9T0506)

RA9T0507 - SNA PassThrough Upstream Device Description

Display Device Description		R
		05/07/93 1
Device description	RA9T0507	
Option	*BASIC	
Category of device	*SNPT	
Local location address	07	
SNA pass-through class	*UP	
Online at IPL	*NO	
Attached controller	RA9P05	
Activation timer	170	
SNA pass-through device desc	DEV3174C3M	
SNA pass-through group name	*NONE	
Text	SNA PT DEV UPSTREAM DEFINITION	

Figure 91. Upstream SNA Pass through Device Description (RA9T0507)

9.5 3174-11R Customization

In the 3174-11R customization, we do the following:

- Enable the 3174-11R APPN functions.
- Specify the 3174-11R network ID and control point name.
- Define the connection to the DOSCOAX2 PS/2 as LEN.
- Define the AS/400 as an adjacent network node.
- Specify the token-ring address for each DSPU.
- Specify the 3174-11R network node as the server for the PS/2's LU.

9.5.1 Defining the 3174 Attachments

Defining the 3174 a SDLC Link to the AS/400

```

      _____ Model / Attach _____

098 _____
099 - 3174 11R SDLC FROM AS400 C30 ITS0 RALEIGH
100 - 11R 1
101 - 2 2

PF: 3=Quit 4=Default 8=Fwd
```

Figure 92. 3174-11R Customization

- 1** Question 100 specifies that this is a remote 3174 (11R).
- 2** Question 101 specifies that this is a SDLC leased connection (2).

Customizing the SDLC Link to the AS/400

SDLC				
104 - C1 1	105 - C8 2	108 - 0000000	110 - 1 0000	116 - 2 _ _
121 - 01	123 - 0	125 - 00000000	126 - 00000000	127 - 0 0
132 - 0 0 0 0	136 - 1 0 0 1	137 - 0 0 0 0	138 - 0	
141 - A	150 - 1 0 3	165 - 1	166 - A	168 - 0
173 - 00000000	175 -	179 - 0 0 0	190 - 00	
213 - 1	215 - 00000	220 - 0		
310 - 0	313 - 1	317 - 0	318 - 0	340 - 1
365 - 0	370 - 1 4			
PF: 3=Quit 4=Default 7=Back 8=Fwd				

Figure 93. Customizing the 3174-11R for an SDLC Link

1 Question 104 specifies the SDLC address of the 3174-11R. In the VTAM definitions, the PU must be coded with XID=YES to allow for a shared (T2.0/T2.1) link.

2 Question 105 defines the upper limit poll address for DSPUs. We will use the poll address:

- C5 for the PS/2 EN CM/2 (PS2ENCM)
- C3 for the PS/2 (DOSCOAX2)

3 Question 150=1 0 enables the token-ring gateway function for DSPUs.

4 It is important to define Question 370=1 to allow inbound RU sizes up to 512 bytes as BINDS may be longer than 256 bytes and they cannot be reassembled by NCP.

9.5.2 Enabling the 3174 APPN

Common SNA			C1/SDLC
500 - 0	501 - USIBMRAA 1	502 - CP3174__	
APPN Support Fields:			
510 - 1 2	511 - CP3174 _ 3	512 - CNET__	
PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH			

Figure 94. Names to Identify the 3174-11R Network Node

1 The 3174-11R is customized as being in network ID USIBMRAA.

2 Question 510=1 enables the APPN functions.

3 Question 511 specifies the control point name used for the 3174-11R.

9.5.3 Assigning the LAN Address

```

_____ Common Network _____
C1/SDLC

900 - 4000 3174 0002 04 1 905 - 1      908 - IBMLAN
911 - 0                      912 - 00

PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH
```

Figure 95. Token-Ring Definition for the 3174-11R

1 Question 900 specifies the token-ring address of the 3174-11R. In Configuration Support-C3 you had to customize the 3174 as a gateway for DSPU in order to customize a LAN attachment.

9.5.4 Defining the DSPU Served by the Gateway

There are several DSPUs being served by the gateway, but we will concentrate on the ones that double as DSPUs and APPN nodes or LENSs.

```

_____ 940: Ring Address Assignment _____

S      Ring Address  SAP  T      S      Ring Address  SAP  T
C1  4000 3174 0002   04      C3  4000 3174 4992 1 04  0
C2  4000 3174 1992   04  0      C5  4000 3174 2992 2 04  0
C4  4000 3174 3992   04  0      C7  4000 3174 6992   04  0
C6  4000 3174 5992   04  0
C8  4000 3174 0003   04  1

PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH
```

Figure 96. Ring Address Assignment

1 Subchannel C3 for the PS/2 (DOSCOAX2)

- SAP 04 is being used by the PC/3270 DSPU for access to the 3270 host via the 3174 gateway function.
- The PS/2 will use SAP 08 when in session with RALYAS4A (as shown in Figure 98 on page 144).

2 Subchannel C5 for the PS/2 EN CM/2 (PS2ENCM)

9.5.5 Defining the 3174 APPN Resources

Defining the Local Resources

_____ APPN Node Definition _____

610 SESSIONS - 1	611 NODES/LINKS - 1
612 WILDCARD - 0 1	613 HOST LINK - 1A

PF: 3=Quit 4=Default 8=Fwd

Figure 97. The 3174-11R Wildcard Option Is Disabled

1 Question 612 shows that the 3174-11R has its wildcard option disabled for the connection to the subarea network.

Defining Adjacent Network Resources: We need to define LEN nodes, network nodes requiring CP-CP session and any node that we want to reserve resources to allow connectivity.

_____ Network Resources _____

	CPNAME	NODE TYPE (1-4)	LUs (X)	DLC TYPE (1-3)	ADDRESS
1	RALYAS4A	1 3		2	
2	DOSCOAX2	2 1	X	1	4000 3174 4992 08 3

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 98. Network Resources

1 The RALYAS4A (AS/400) is defined as an adjacent network node with NODE TYPE of 3, (which is a network node and a DLC TYPE of 2, which is SDLC attached).

2 DOSCOAX2 (PS/2) is defined as NODE TYPE of 1, which is a LEN, An X in the LUs column indicates that there are local LU(s) to be defined on the Associated LUs panel, as shown in Figure 99 on page 145, and a DLC TYPE of 1, which is Token-Ring attached.

3 Indicates that the PS/2 will use SAP 08 when in session with RALYAS4A. SAP 04 is being used by the PC/3270 DSPU for access to the 3270 host via the 3174 gateway function.

Associated LUs

```

_____ Associated LUs _____
CPNAME      LUNAME      LUNAME      LUNAME      LUNAME      SERVING NN
1 DOSCOAX2   DOSCOAX2   _____ _____ _____ 1 CP3174__

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 99. Associated LUs

1 DOSCOAX2 LU is defined with the 3174-11R as the network node server.

9.5.6 Mode/COS Correlation

```

_____ Mode/COS Correlation _____

Mode Name   #   COS Name           Mode Name   #   COS Name
#BATCH__    _   #BATCH__           M2SDLCQ_    _   #CONNECT
#BATCHSC    _   #BATCHSC        SD82__      _   #CONNECT
#INTER__    _   #INTER__        QPCSUPP_    1   #CONNECT
#INTERSC    _   #INTERSC        _____  _   _____
blank       _   #CONNECT        _____  _   _____
_____     _   _____        _____  _   _____
_____     _   _____        _____  _   _____

Define Mode/COS pairs. To specify IBM-supplied COS names, place 1-5 in
the #-column. 1=#BATCH 2=#BATCHSC 3=#INTER 4=#INTERSC 5=#CONNECT

PF: 3=Quit 4=Default 7=Back 8=Fwd

```

Figure 100. Correlation of Mode and COS

1 The mode need not exist in an intermediate node. It needs to be known at the network node server for a LEN node. We have defined the mode name QPCSUPP, and COS name #CONNECT is required for the PC Support/400 connection of LEN device DOSCOAX2.

9.6 LAN Adapter and Protocol Support Configuration

Since the 3174 uses the LAN adapter address in the customization of DSPU links, we use LAN Adapter and Protocol Support (LAPS) to configure the SNA protocol and appropriate LAA for the CM/2 workstation.

Configure Workstation

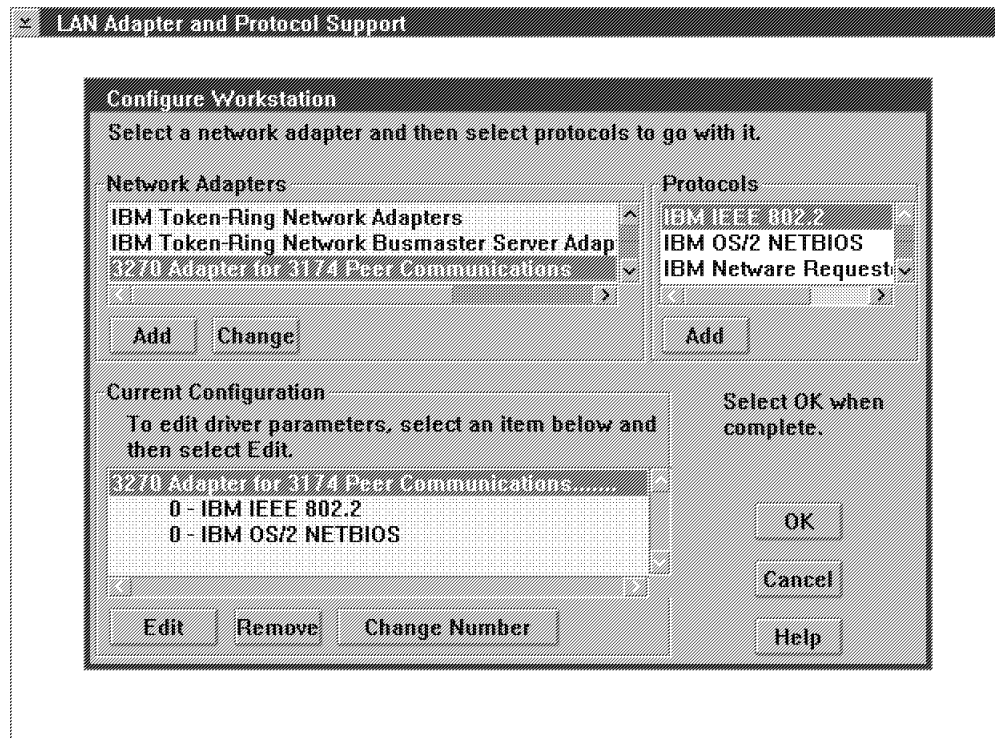


Figure 101. The Configure Workstation Panel

1. Select **3270 Adapter for 3174 Peer Communication**.
2. Select **IBM IEEE 802.2** protocol for SNA support.
3. Select **OK**. You will be presented the panel in Figure 102.

Network Adapter Address

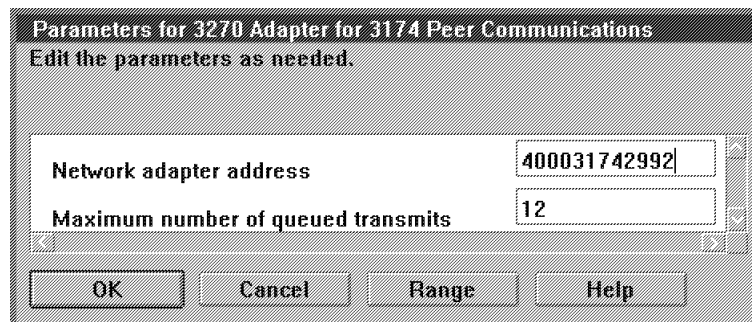


Figure 102. Network Adapter Address

1. The LAA we are using is 400031742992.
2. Select **OK**. We have elected to have the CONFIG.SYS automatically updated as shown in Figure 103 on page 147.

9.6.1 LAN Adapter and Protocol Support (CONFIG.SYS)

We allowed LAPS to modify our CONFIG.SYS to add support for the 3174 Peer Communications (3270) adapter.

```
IFS=E:\OS2\HPFS.IFS /CACHE:128 /CRECL:4 /AUTOCHECK:E
DEVICE=E:\CMLIB\ROCSDD.SYS
DEVICE=E:\IBMCOM\PROTOCOL\LANPDD.OS2
DEVICE=E:\IBMCOM\PROTOCOL\LANVDD.OS2
DEVICE=E:\IBMCOM\PROTMAN.OS2 /I:E:\IBMCOM
DEVICE=E:\IBMCOM\LANMSGDD.OS2 /I:E:\IBMCOM
PROTSHELL=E:\OS2\PMSHELL.EXE
SET USER_INI=E:\OS2\OS2.INI
SET SYSTEM_INI=E:\OS2\OS2SYS.INI
SET OS2_SHELL=E:\OS2\CMD.EXE
SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS
SET RUNWORKPLACE=E:\OS2\PMSHELL.EXE
SET COMSPEC=E:\OS2\CMD.EXE
LIBPATH=E:\IBMCOM\DLL;.;E:\OS2\DLL;E:\OS2\MDOS;E:\;E:\OS2\APPS\DLL;E:
\CMLIB\DLL;E:\MUGLIB\DLL;
SET PATH=E:\OS2;E:\OS2\SYSTEM;E:\OS2\MDOS\WINOS2;E:\OS2\INSTALL;E:\;E:
\OS2\MDOS;E:\OS2\APPS;E:\CMLIB;E:\MUGLIB;E:\IBMCOM;
SET DPATH=E:\IBMCOM;E:\OS2;E:\OS2\SYSTEM;E:\OS2\MDOS\WINOS2;E:
\OS2\INSTALL;E:\;E:\OS2\BITMAP;E:\OS2\MDOS;E:\OS2\APPS;E:\CMLIB;E:
\MUGLIB\DLL;
:
:
:      missing information from other files
:
:
DEVICE=E:\CMLIB\ACSLANDD.SYS
DEVICE=E:\CMLIB\CMKFMDE.SYS
DEVICE=E:\OS2\LOG.SYS
RUN=E:\OS2\SYSTEM\LOGDAEM.EXE
RUN=E:\OS2\EPWROUT.EXE 1
RUN=E:\OS2\EPW.EXE
RUN=E:\IBMCOM\PROTOCOL\NETBIND.EXE
RUN=E:\IBMCOM\LANMSGEX.EXE
DEVICE=E:\IBMCOM\PROTOCOL\LANDD.OS2
DEVICE=E:\IBMCOM\PROTOCOL\LANDLLDD.OS2
RUN=E:\IBMCOM\PROTOCOL\LANDLL.EXE
DEVICE=E:\IBMCOM\MACS\IBMXLN.OS2
DEVICE=E:\IBMCOM\PROTOCOL\NETBEUI.OS2
DEVICE=E:\IBMCOM\PROTOCOL\NETBIOS.OS2
```

Figure 103. LAN Adapter and Protocol Support (CONFIG.SYS)

9.7 Communications Manager/2 Definition

In Communications Manager/2 definitions, we do the following:

- Identify the PS/2 EN node by giving its network name and node name.
- Define the local LU, which is in the PS/2.
- Define the partner LU, which is in the AS/400.
- Specify the destination address, which is the address of the 3174-11R network node server.
- Specify the mode name to be used.
- Specify the initial session limit parameters.
- Configure 3270 emulation and assign to terminal LUs.
- Configure 5250 emulation and assign two 5250 terminal sessions to the local LU.

9.7.1 Communications Manager/2 Installation and Setup Version 1.0

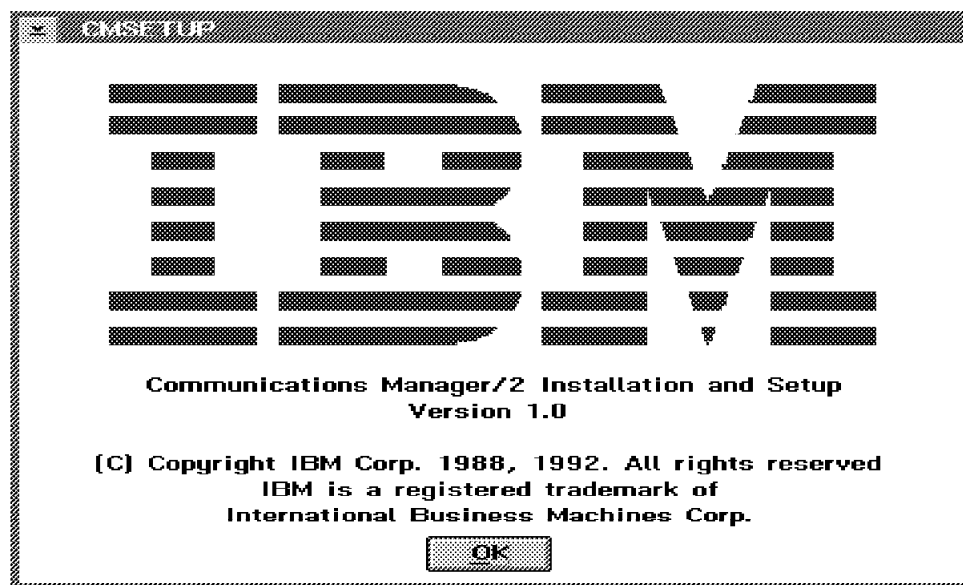


Figure 104. Communications Manager/2 Installation and Setup Version 1.0

9.7.2 Configuring 3270 Emulation

Communication Manager Configuration Definition for 3270 Emulation

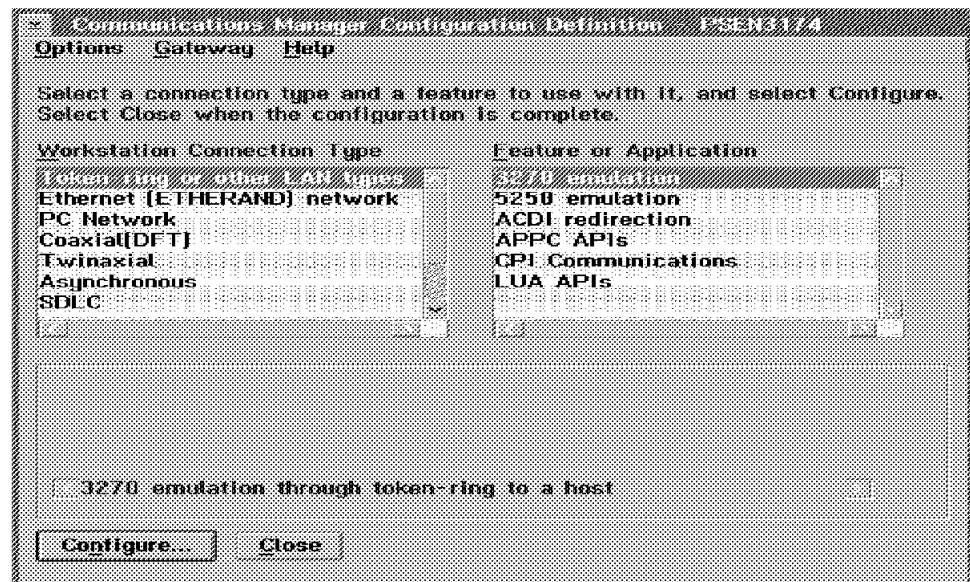


Figure 105. Configuration Definition Panel for 3270 Emulation

1. Select **Token-Ring or Other LAN types** and **3270 emulation**, then **Configure** to get the panel in Figure 106.

3270 Emulation through Token-Ring

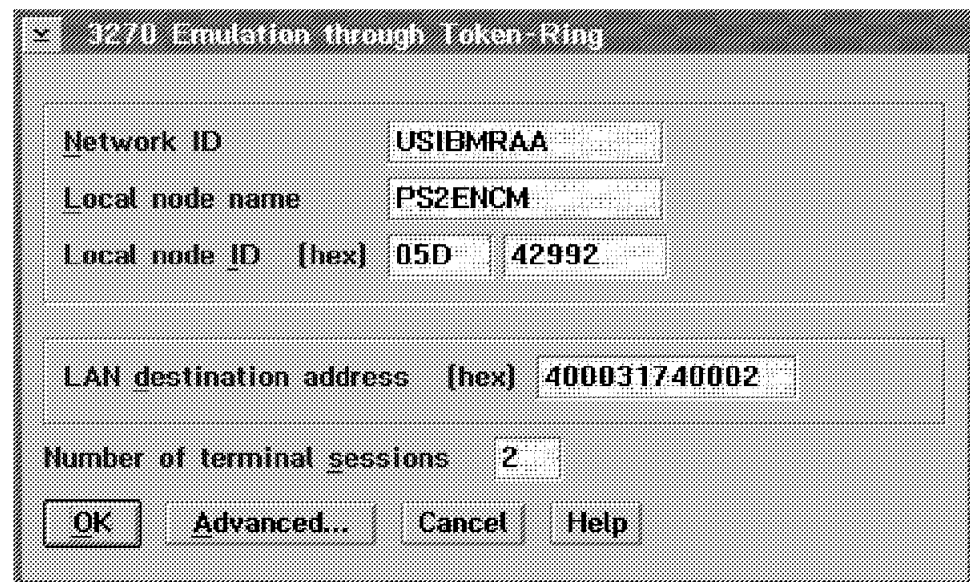


Figure 106. 3270 Emulation through Token-Ring

1. Enter Network ID USIBMRAA.
2. Enter Local node name or PUID PS2ENCM
3. Local Node ID (IDNUM) is not required when the gateway is a 3174.
4. Enter the LAA of the 3174-11R as the LAN destination address.
5. We desired 2 sessions.
6. Select **Advanced**. You will get the panel in Figure 107 on page 150.

9.7.3 Configuring the Data Link Control

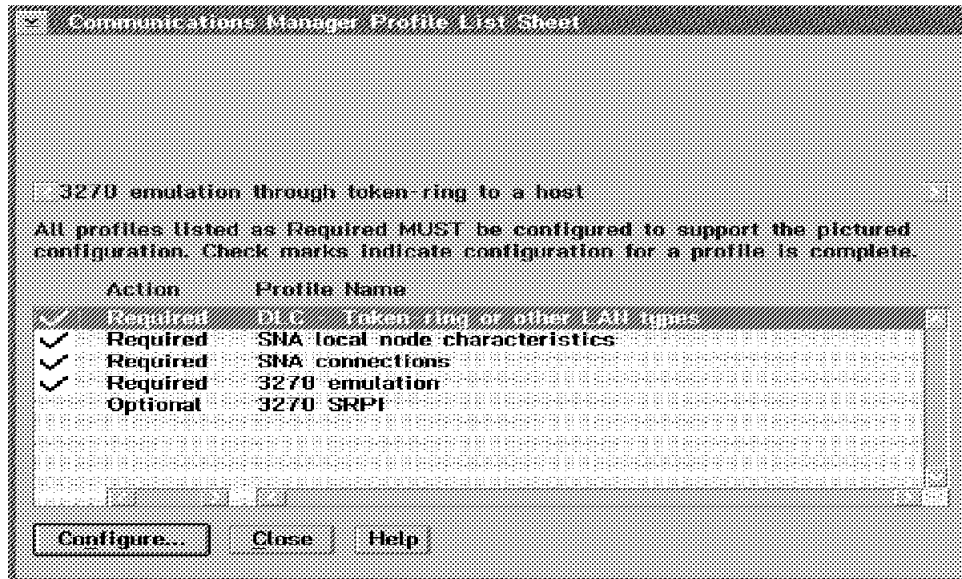


Figure 107. Communication Manager Profile List Sheet

1. Select **Required DLC - Token-Ring or other LAN types**
2. Select **Configure**. You will get the panel in Figure 108.

Token-Ring or Other LAN Types DLC Adapter Parameters

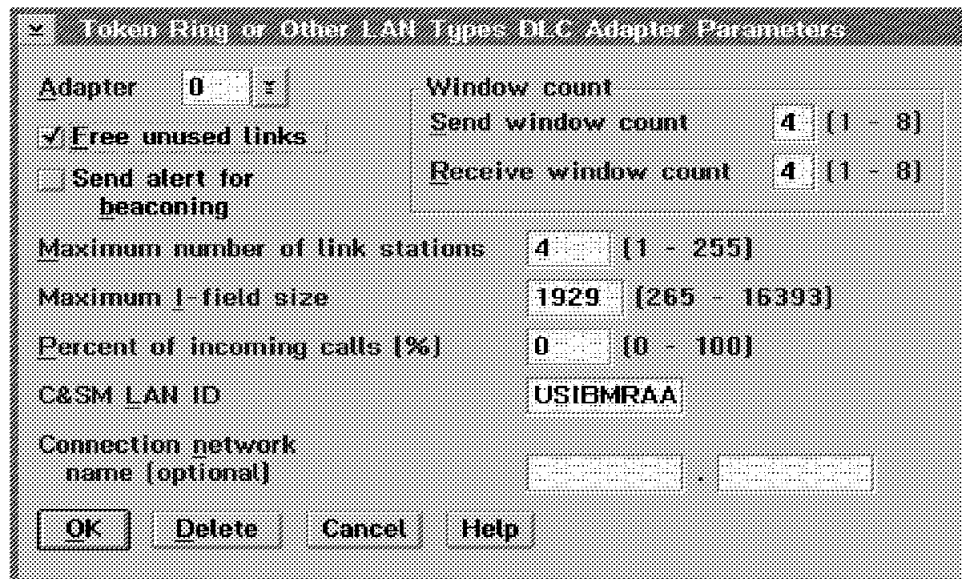


Figure 108. Token-Ring or Other LAN Types DLC Adapter Parameters

1. Select **Free unused links** to free the link when there are no conversations.
2. Select **OK**. You will get the panel in Figure 109 on page 151.

9.7.4 Configuring the Local Node Characteristics

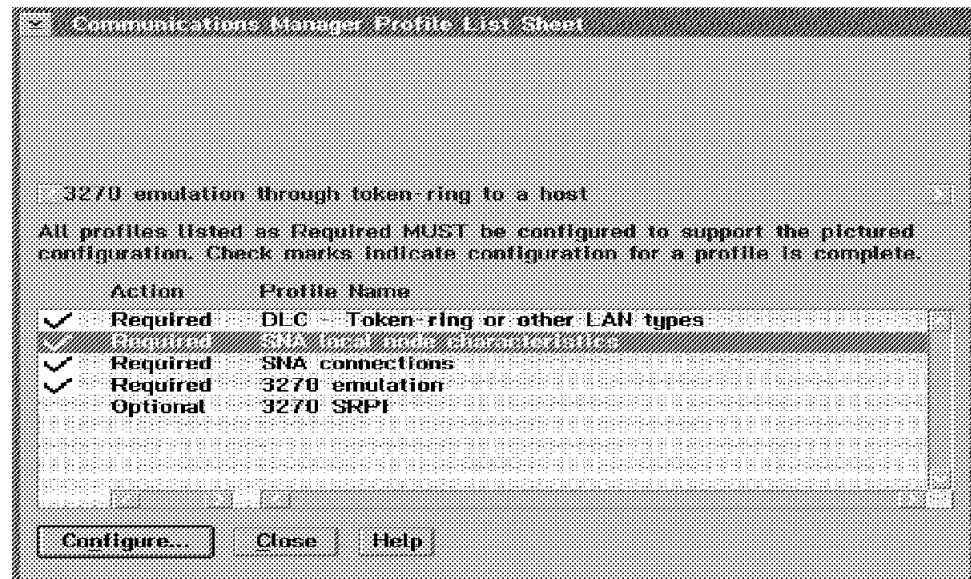


Figure 109. Communication Manager Profile List Sheet

1. Select **Required SNA local node characteristics**.
2. Select **Configure**. You will get the panel in Figure 110.

Local Node Characteristics

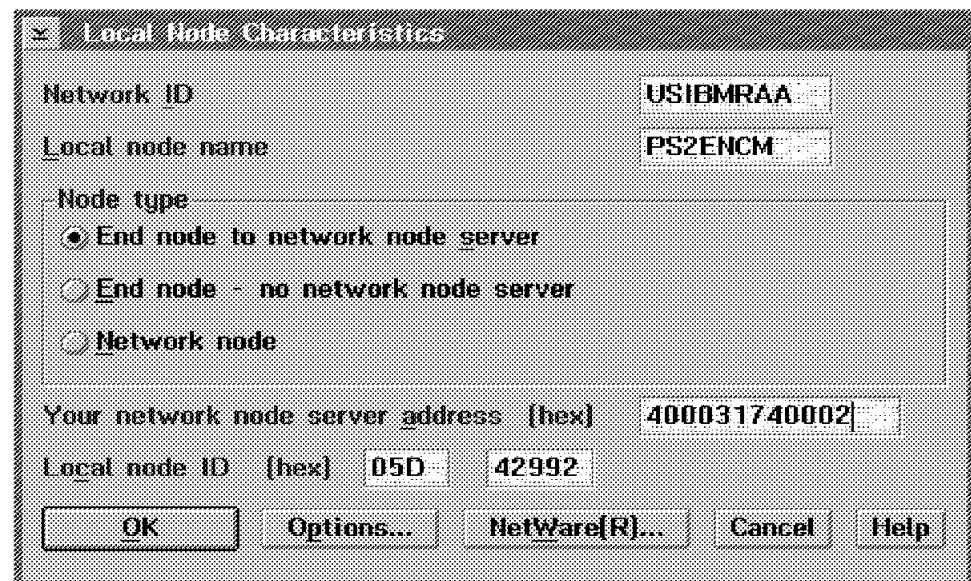


Figure 110. Local Node Characteristics

1. Enter the LAA of the 3174 as the address of your network node server address (hex).
2. Select **OK**. You will get the panel in Figure 111 on page 152.

9.7.5 Configuring the SNA Connections

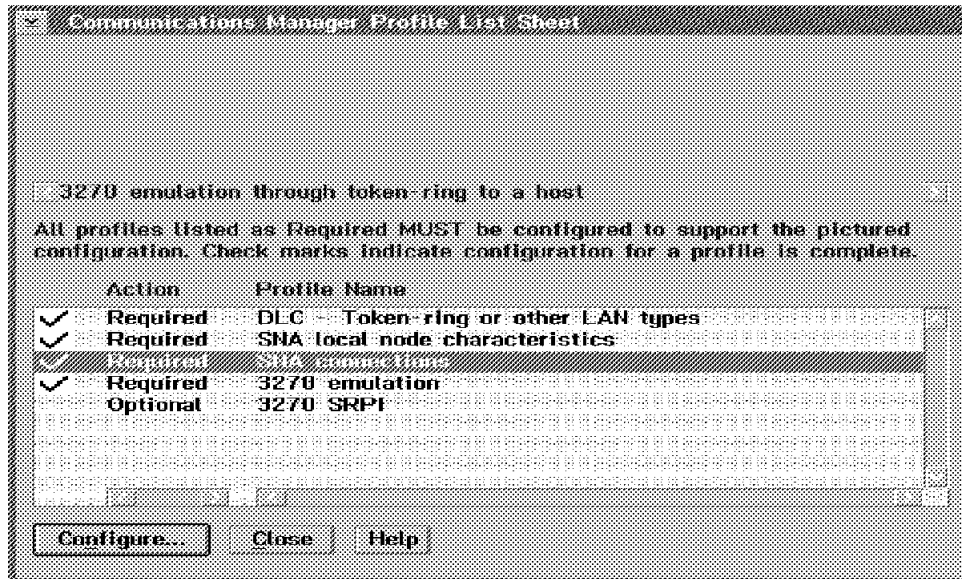


Figure 111. Communication Manager Profile List Sheet

1. Select **Required SNA connections**.
2. Select **Configure**. You will get the panel in Figure 112.

Connections List

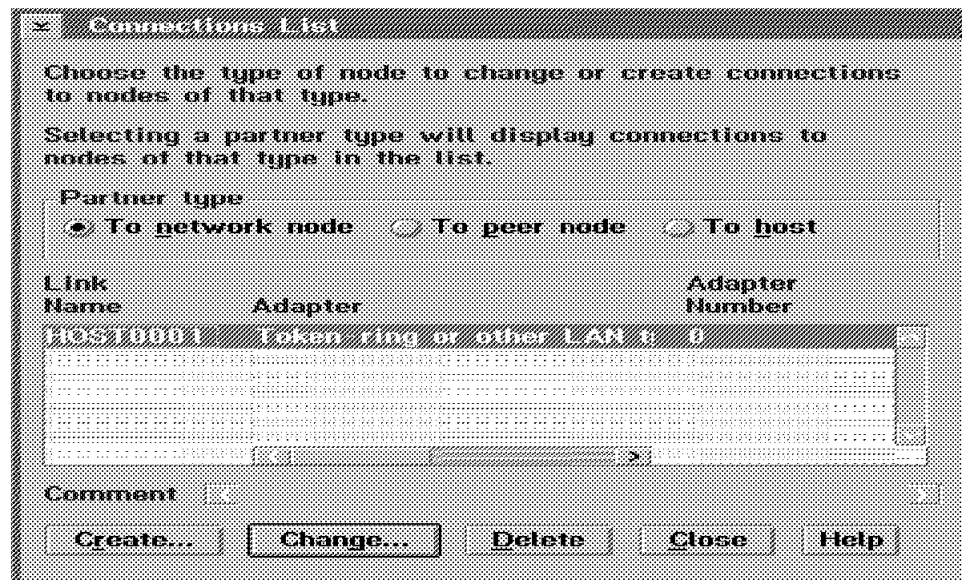


Figure 112. Connections List

1. The Partner type is **To network node**.
2. Select the Link Name shown if you want to use the default link.
3. Select **Change** (to change the selected link) or **Create** (to create a new link) and you will get the panel in Figure 113 on page 153.

Adapter List

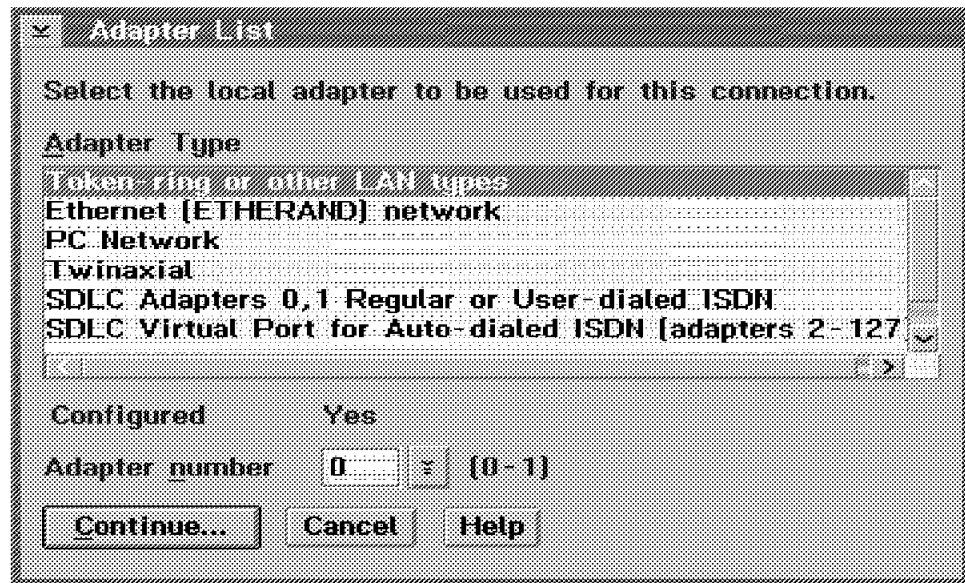


Figure 113. Adapter List

1. Select **Token-Ring or other LAN types**.
2. Select **Continue**. You will get the panel in Figure 114.

Change or Create a Connection to a Network Node

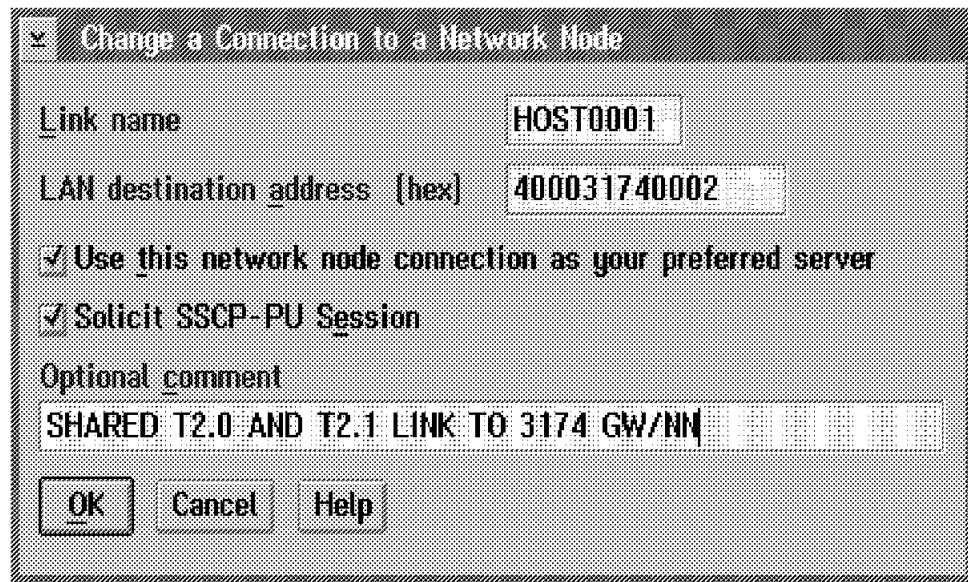


Figure 114. Change a Connection to a Network Node

1. Select **Use this network node connection as your preferred server** so that you will have a CP-CP session with the 3174 NN.
2. Select **Solicit SSCP-PU Session** so that you will have dependent sessions through the 3174 gateway as well as independent sessions through the 3174 NN.
3. Select **OK**. You will get the panel in Figure 115 on page 154.

9.7.6 Configuring 3270 Emulation Sessions

Communication Manager Profile List Sheet

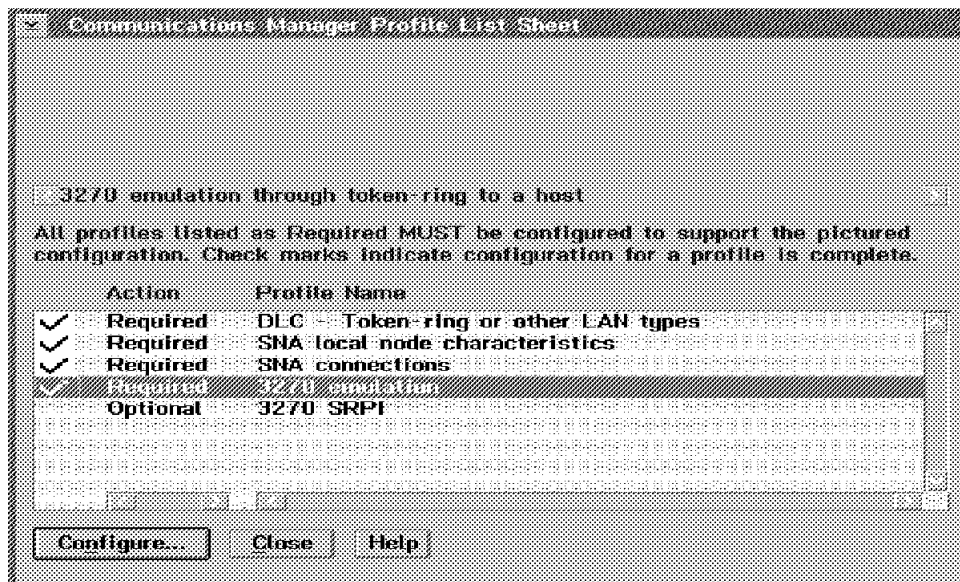


Figure 115. Communication Manager Profile List Sheet

1. Select **Required 3270 emulation**.
2. Select **Configure**. You will get the panel in Figure 116.

3270 Emulation

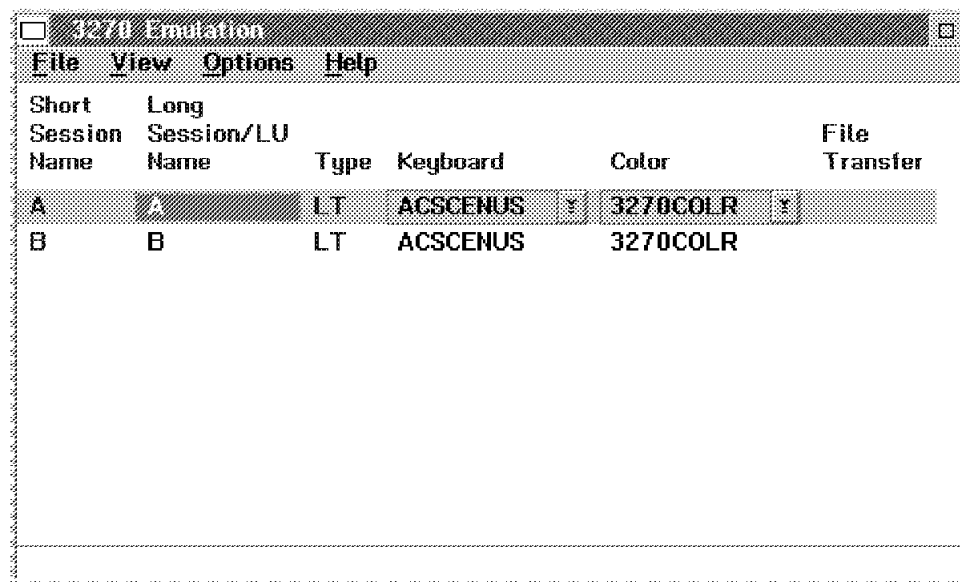


Figure 116. 3270 Emulation

1. Double-click on the Long Session/ LU Name and you will get the panel shown in Figure 117 on page 155.

Logical Terminal Configuration

The screenshot shows the '3270 Logical Terminal - A' configuration window. It includes fields for 'Short session name' (A), 'Optional comment', 'Type of connection' (Non-coaxial selected), 'Session number' (888), 'Host link name' (HOST0001), and 'LU local/NAU address' (2). The 'Presentation space size' section has radio buttons for 25 x 80, 33 x 80, 44 x 80, 28 x 132, and Other (set to 25 rows and 80 columns). On the right, there are checkboxes for 'Auto-start' and 'Activate presentation space print', and a list of 'Options' including 'Character mapping', 'Data transfer buffer size override', 'Print options', 'Print style', and 'Runtime window status'. At the bottom are 'Save', 'Save as...', 'Cancel', and 'Help' buttons, and a 'Change...' button near the options list.

Figure 117. Logical Terminal Configuration

1. Assign the appropriate link and NAU.
2. Save and close your configuration.

9.7.7 Configuring 5250 Emulation

Communication Manager Configuration Definition for 5250 Emulation

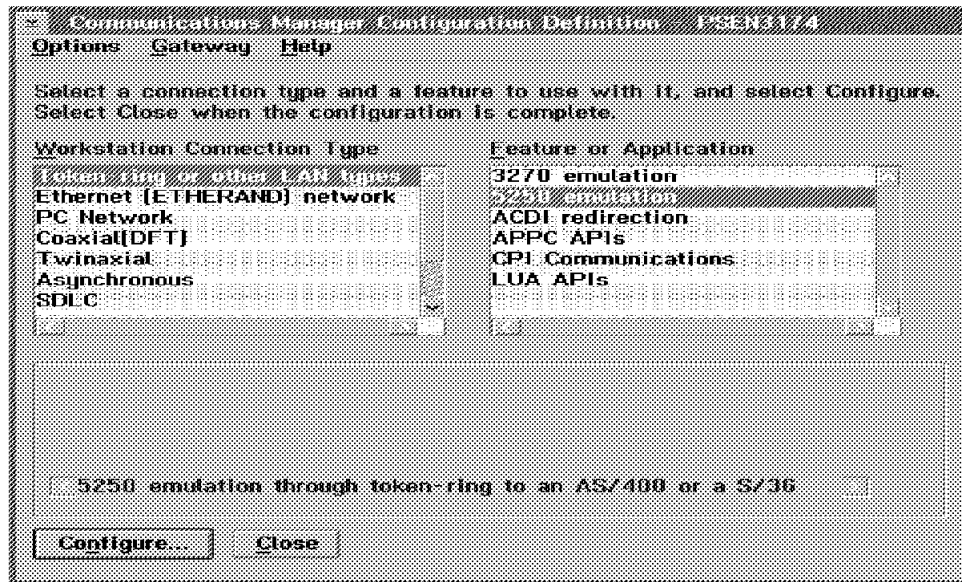


Figure 118. Communication Manager Configuration Definition Panel

1. Select **Token-Ring or Other LAN types** and **5250 emulation**, then select **Configure** to get the panel in Figure 119.

5250 Emulation through Token-Ring

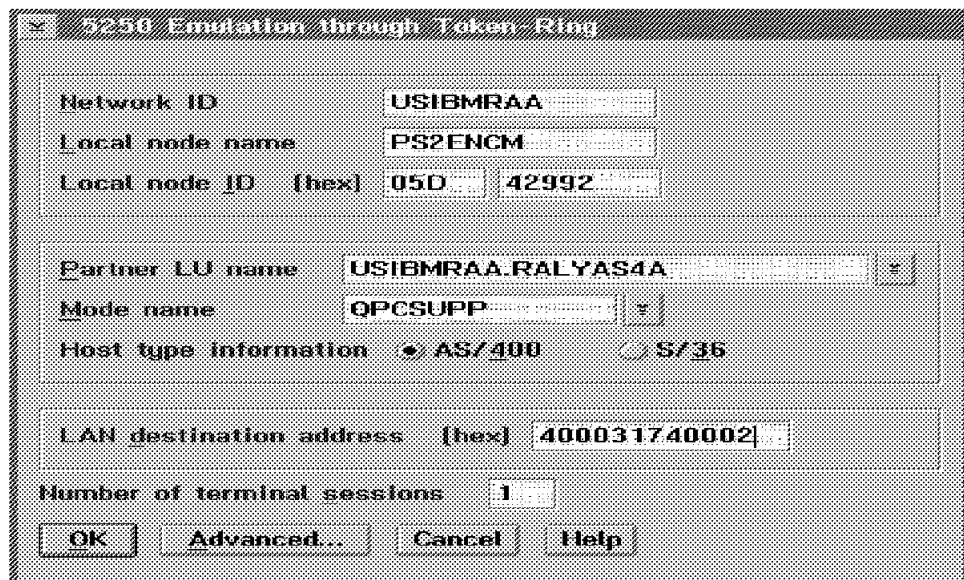


Figure 119. 5250 Emulation Through Token-Ring

1. Enter Network ID USIBMRAA and Local node name PS2ENCM.
2. Enter the Partner LU name USIBMRAA.RALYAS4A.
3. A mode name of QPCSUPP is required for PC support to the AS/400.
4. Enter the LAA of the 3174-11R as the LAN destination address.
5. Select **Advanced** and you will get the panel shown in Figure 120 on page 157.

9.7.8 Configuring the SNA Connection

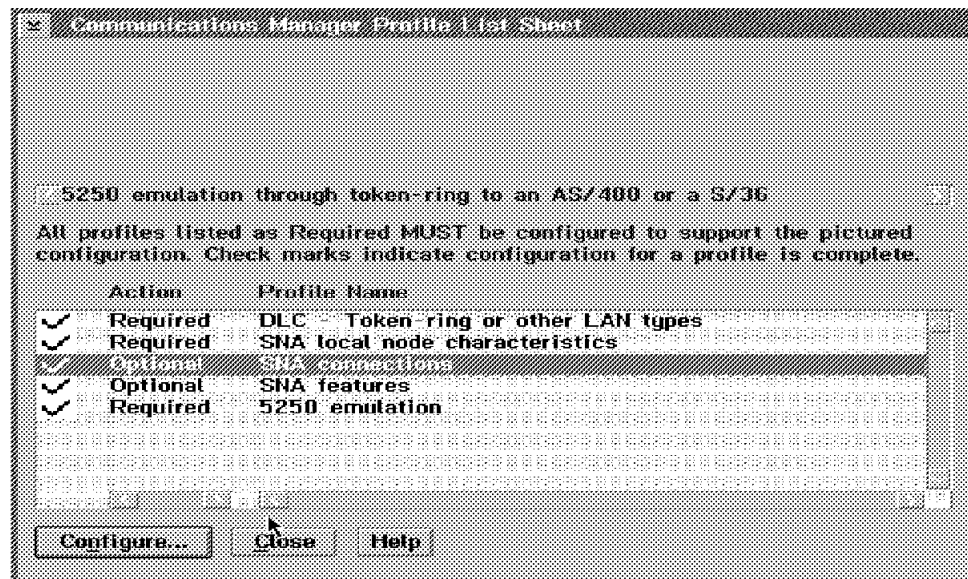


Figure 120. Communication Manager Profile List Sheet

1. Select **Optional SNA connections**.
2. Select **Configure**. You will get the panel in Figure 121.

Connections List

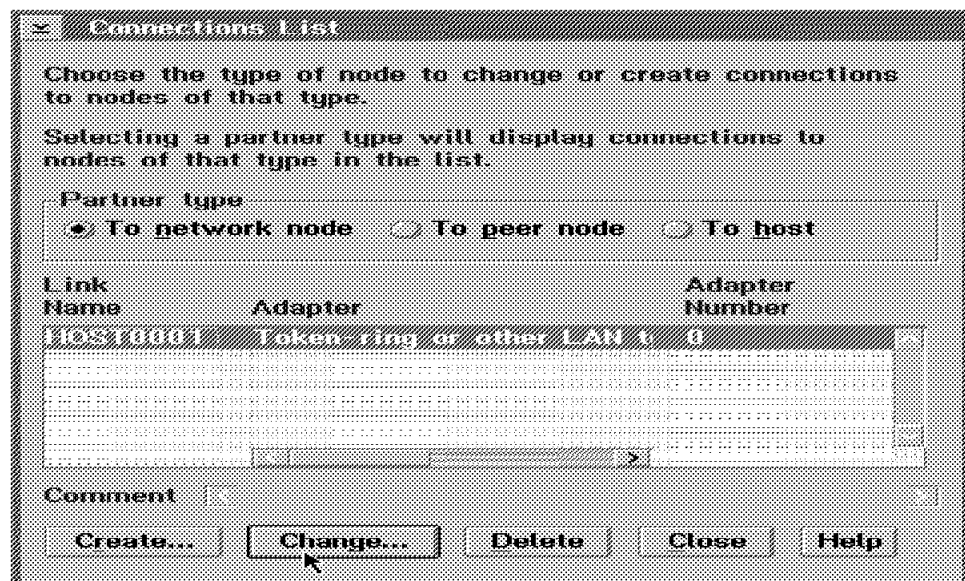


Figure 121. Connections List

1. Select Link Name **HOST0001**. This should be the same link name used in the 3270 emulation configuration for the Partner type To network node.
2. Select **Change**. You will get the panel in Figure 122 on page 158.

Note: Delete the default link To peer node (LINK001).

Adapter List

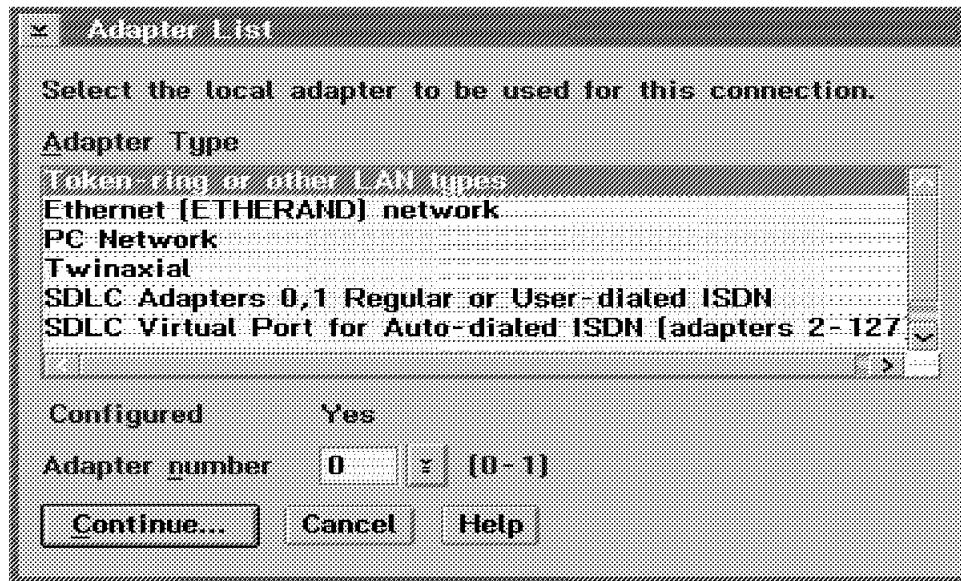


Figure 122. Adapter List

1. Select **Token-Ring or other LAN types**
2. Select **Continue**. You will get the panel in Figure 123.

Change a Connection to a Network Node

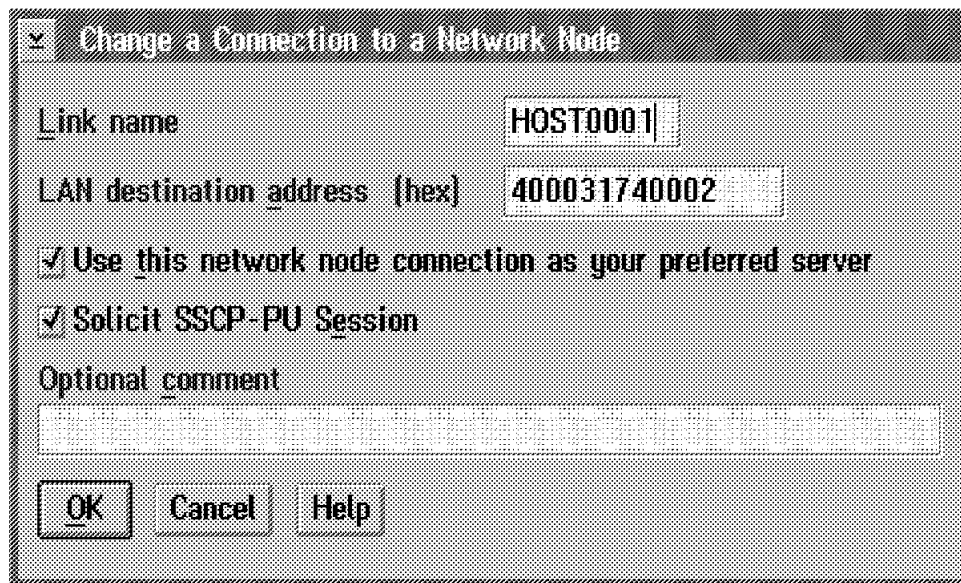


Figure 123. Change a Connection to a Network Node

1. Enter the Link name.
2. Verify that the information is the same as what was supplied in the 3270 emulation configuration.
3. Select **OK** and close the configuration so that it can be verified.

9.7.9 Communication Manager/2 (PSEN3174.NDF)

```
1 DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRAA.PS2ENCM )
2                  CP_ALIAS(PS2ENCM )
                  NAU_ADDRESS(INDEPENDENT_LU)
3                  NODE_TYPE(EN)
                  NODE_ID(X'05D42992')
                  HOST_FP_SUPPORT(YES);

DEFINE_LOGICAL_LINK LINK_NAME(HOST0001)
                    FQ_ADJACENT_CP_NAME(USIBMRAA.RALYAS4A )
4                    ADJACENT_NODE_TYPE(NN)
5                    PREFERRED_NN_SERVER(YES)
6                    DLC_NAME(IBMTRNET)
                    ADAPTER_NUMBER(0)
7                    DESTINATION_ADDRESS(X'400031740002')
8                    CP_CP_SESSION_SUPPORT(YES)
                    ACTIVATE_AT_STARTUP(YES)
                    LIMITED_RESOURCE(NO)
                    LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                    SOLICIT_SSCP_SESSION(YES)
                    EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                    COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                    COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                    SECURITY(USE_ADAPTER_DEFINITION)
                    PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_3(USE_ADAPTER_DEFINITION);

9 DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(USIBMRAA.RALYAS4A )
                    PARTNER_LU_ALIAS(5250PLU)
10                   PARTNER_LU_UNINTERPRETED_NAME(RALYAS4A)
                    MAX_MC_LL_SEND_SIZE(32767)
                    CONV_SECURITY_VERIFICATION(NO)
                    PARALLEL_SESSION_SUPPORT(YES);

11 DEFINE_MODE  MODE_NAME(QPCSUPP )
                COS_NAME(#CONNECT)
                DEFAULT_RU_SIZE(NO)
                MAX_RU_SIZE_UPPER_BOUND(1024)
                RECEIVE_PACING_WINDOW(7)
                MAX_NEGOTIABLE_SESSION_LIMIT(32767)
                PLU_MODE_SESSION_LIMIT(64)
                MIN_CONWINNERS_SOURCE(32);

DEFINE_DEFAULTS  IMPLICIT_INBOUND_PLU_SUPPORT(YES)
                 DEFAULT_MODE_NAME(BLANK)
                 MAX_MC_LL_SEND_SIZE(32767)
                 DIRECTORY_FOR_INBOUND_ATTACHES(*)
                 DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
                 DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
                 DEFAULT_TP_CONV_SECURITY_RQD(NO)
                 MAX_HELD_ALERTS(10);

START_ATTACH_MANAGER;
```

Figure 124. Communication Manager/2 (PSEN3174.NDF)

- 1** The fully qualified name of the PS/2 network node
- 2** The alias name for the local LU
- 3** The node type for the PS/2
- 4** The node type for the adjacent node, the 3174-11R
- 5** Indicates whether the adjacent node is the server
- 6** Indicates that token-ring is the DLC to be used
- 7** The token-ring address of the adjacent node
- 8** Indicates whether CP-CP sessions are supported with the adjacent node
- 9** The fully qualified name of the partner LU in the AS/400
- 10** The alias name for the partner LU
- 11** The mode to be used for 5250 emulation

9.8 Configuring the DOS Workstation

Unlike the OS/2 workstation where CM/2 provides both 3270 and 5250 emulation, on the DOS workstation we have configured and installed the following products:

- Personal Communications/3270 V3.1 for 3270 emulation
- PC Support/400 for Extended DOS router to AS/400
- PC Support RUMBA/400 for 5250 emulation

9.8.1 Configuring 3270 Emulation

In Personal Communication/3270 definitions, we do the following:

- Identify that we are using Peer Communications (LAN over coax) for our logical transport.
- Configure the Destination LAN address of the 3174 gateway.

Customize Communication

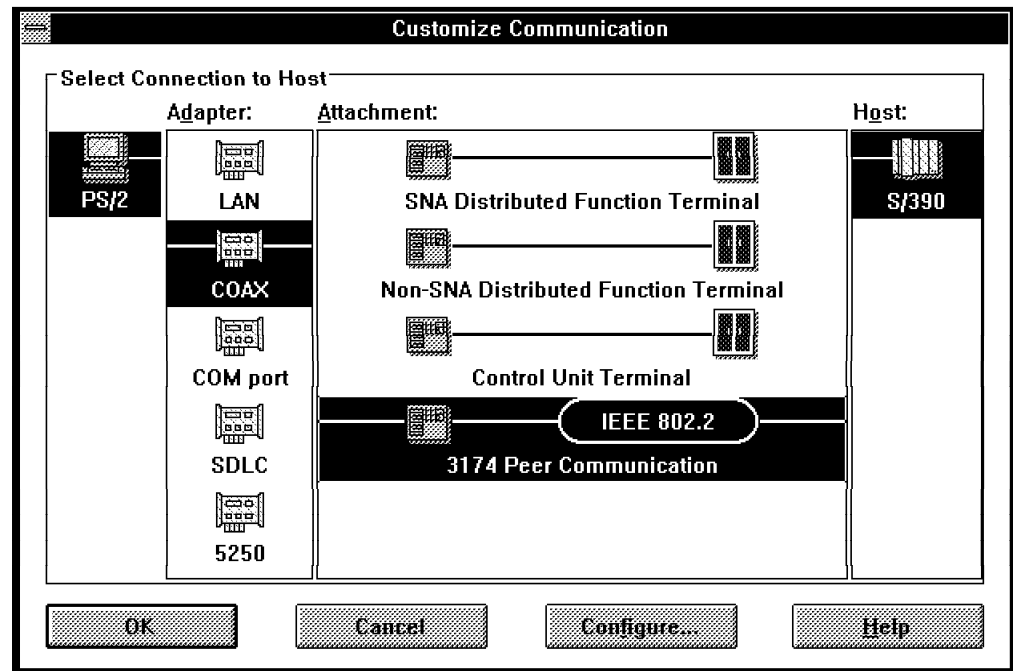


Figure 125. Customize Communication

1. Select Adapter **COAX**.
2. Select Attachment **3174 Peer Communication**.
3. Select **Configure** and you will be presented the panel shown in Figure 126 on page 162.

Customize Communication - 3270 Host

Customize Communication - 3270 Host

Session Parameters

Screen Size: 24x80

Session Type: ☒ Display ☐ Printer

Enable Host Graphics: ☐ Yes ☒ No

Host Code-Page: 037 United States

LU number: Default [Next Available]

SNA Parameters: [Configure SNA...](#)

Link Parameters - 3174 Peer Communication

Link Parameters: [Configure Link...](#)

[OK](#) [Cancel](#) [Help](#)

Figure 126. Customize Communication - 3270 Host

1. Select **Configure Link** and you will be presented the panel shown in Figure 127.

IEEE 802.2

IEEE 802.2

Adapter Number: 0

Destination Address: 400031740002

Remote SAP: 04

PIU Size: 265

Physical Unit ID: 00000

Block ID: 061

[Advanced...](#)

[OK](#) [Cancel](#) [Help](#)

Figure 127. IEEE 802.2

1. Enter the Destination Address 400031740002 of the 3174 gateway.
2. Let the PIU Size default to 265 to match the default size specified in the 3174 configuration Question 941.
3. Select **OK**. You have completed the required PC/3270 customization.

9.8.2 Configuring Connection to AS/400

To install the PC Support/400 on your PS/2, put the INSTALL diskette in the A: drive and type INSTALL. We have only provided the panel that deals with the PC connection to an AS/400 system.

PC Support/400 Installation (PC to AS/400 Connection)

```
PC Support/400 Installation
(PC to AS/400 Connection)

Select choices, press Enter.

Connection Information
Press spacebar to select connection type:
  1. Twinaxial
  1 2. Local Area Network
  3. Synchronous Data Link Control
  4. Asynchronous communications

PC Information
PC location name. . . . . USIBMRAA.DOSCOAX2 2

System Information
Name of system to connect to. . . . . RALYAS4A 3

System LAN address. . . . . 400031740002 4
Ensure the address is typed correctly.

Enter Esc=Cancel F1=Help F3=Exit
```

Figure 128. PC Support/400 Installation (PC to AS/400 Connection)

- 1 On this menu, select option 2 for Local Area Network even though the physical medium is coax for Peer Communications.
- 2 The NETID and LU name of the PS/2.
- 3 The CP name of the AS/400 which will be the default system server for PC Support/400 functions.
- 4 The token-ring address of the 3174-11R is supplied since it is the network node server for this LEN.

9.8.2.1 PC Support/400 Installation (CONFIG.PCS) File

```
SFLR 1,I,,RALYAS4A 3
UPDT I:\Q\WSFL2,D:\PCS,S,,,PC Support/400
RTYP ITRN
TRSS 08 5
RTLN USIBMRAA.DOSCOAX2 2
INTL 68
TRAN 0
TRRL 3
TRAL 8
TRAS 1
TRMF 2048
TRLI RALYAS4A,400031740002 4
UPDT I:\QRUMBA,C:\RUMBAPCS,S,,,RUMBA/400
```

Figure 129. PC Support/400 Installation (CONFIG.PCS) File

The contents of the CONFIG.PCS file for this configuration are shown in Figure 128. Note that 2, 3, and 4 match those shown in Figure 129.

- 5 Indicates SSAP 08 is used to start PC Support/400 sessions with RALYAS4A. The AS/400 will automatically create a controller description for DOSCOAX2 with DSAP=08. This will allow PC Support/400 and Personal Communications/3270 to operate concurrently.

9.8.3 PC Support RUMBA/400 for 5250 Emulation (T2.1)

In Personal Computer Support RUMBA definitions, we do the following:

- Identify the PS/2 LEN node and the AS/400 as the system to connect.
- Connect the session.

Session Information

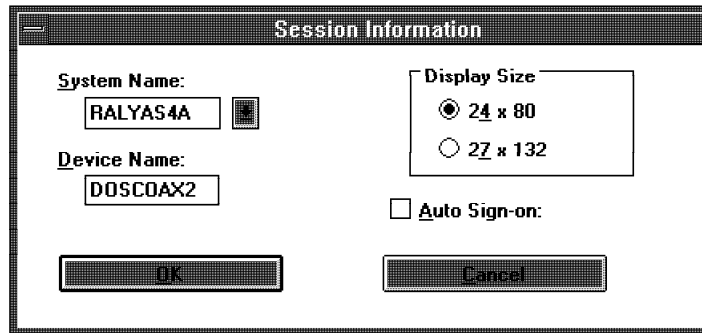


Figure 130. Session Information

1. Enter the AS/400 remote System Name RALYAS4A.
2. Enter the local Device (LU) Name DOSCOAX2.
3. Select **OK** to complete the configuration.

Session Connection

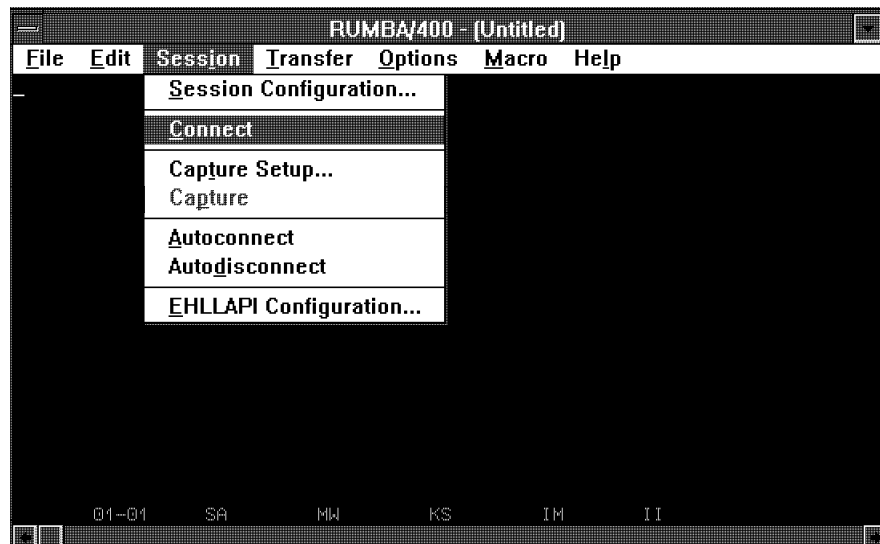


Figure 131. Session Connection

1. Select **Session** from the session bar.
2. Select **Connect** to establish the session.

9.8.4 DOS CONFIG.SYS

```
DEVICE=C:\DOS52\SETVER.EXE
DEVICE=C:\DOS52\HIMEM.SYS
DOS=HIGH
FILES=30
DEVICE=C:\LSP\PROTMAN.DOS /I:C:\LSP
DEVICE=C:\LSP\IBMXLN.DOS
DEVICE=C:\LSP\DXMA0MOD.SYS
DEVICE=C:\LSP\DXE0MOD.SYS 400031744992
DEVICE=C:\LSP\DXT0MOD.SYS ES=2 EST=4
DEVICE=E:\PCS\EIMPCS.SYS P=0
```

Figure 132. CONFIG.SYS for PC/3270 and PC Support Coexistence

We have coded **ES=2** and **EST=4**, to have the adapter open with enough resources for PC/3270 and PC Support/400.

The LAA of the DOSCOAX workstation is **400031744992** which is supplied in the 3174 Question 940 as the DSPU LAN address.

9.9 Verification at the 3174

3174-11R Online Test /17,2

Adjacent Nodes

LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP	
1	1	USIBMRAA	RALYAS4A	NN	OPEN	08	4	NO
2	4	USIBMRAA	PS2ENCM	EN	OPEN	08	2	YES
3	9	USIBMRAA	DOSCOAX2	LN	OPEN	08	1	NA

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test
PF: 3=Quit 5=Refresh 12=Test Menu

Figure 133. Display of Nodes Adjacent to the 3174-11R

- 1 There are four sessions from the 3174-11R to the network node (RALYAS4A), but no CP-CP session.
- 2 Shows two sessions from the 3174-11R (CP3174) to the end node PS2ENCM and the CP-CP session between CP3174 and PS2ENCM.
- 3 DOSCOAX2 as LEN node has no capability of CP-CP session.

9.10 Verification and Activation from the AS/400

Now that we have configured everything, we can activate the controllers which will attach them to the line and activate associated devices. Note that the configuration status shows other controllers (CTL3174C3 and CTL3174C4), of which we have not shown the configuration. These controllers are DSPUs being served by the 3174 gateway.

Work with Configuration Status			R
Opt	Description	Status	-----Job-----
---	LIN3174C3	VARIED ON	
---	CTL3174C3M	VARIED ON	
---	DEV3174C3M	VARIED ON	
---	DEV3174C33	VARIED ON	
---	PS2ENCM	VARIED ON	
---	DOSCOAX2	VARIED ON	
---	CP317400	VARIED ON	
---	CTL3174C3	VARIED ON	
---	DEV3174D02	VARIED ON	
---	CTLDOSCOAX2	VARIED ON	
---	DEVDOOSCOAX2	VARIED ON	
---	CTLPS2ENCM	VARIED ON	
---	DEVPS2ENCM	VARIED ON	
---	CTL3174C4	VARIED ON	
---	DEV3174C42	VARIED ON	
---	RA9L005	VARIED ON	
---	RA9P05	VARIED ON	
---	RA9T0506	VARIED ON	
---	RA9T0507	VARIED ON	

Figure 134. Configuration Status

Chapter 10. SNA Primary LU2 Support (SPLS) via a 3174 GW

This scenario involves using the 3174 gateway and APPN functions in conjunction with the SNA Primary LU2 Support (SPLS) of OS/400 V3.0. The following section will show the VTAM definitions for the 3174 GW/NN and for all systems using the 3174 as the gateway or their network node server. Both gateway and NN definitions are required to run the SNA Primary LU2 support through the 3174 using the same physical link.

It illustrates the ability of the 3174 to support APPN over a parallel channel. In Configuration Support-C6 this is possible over an ESCON channel.

10.1 Configuration

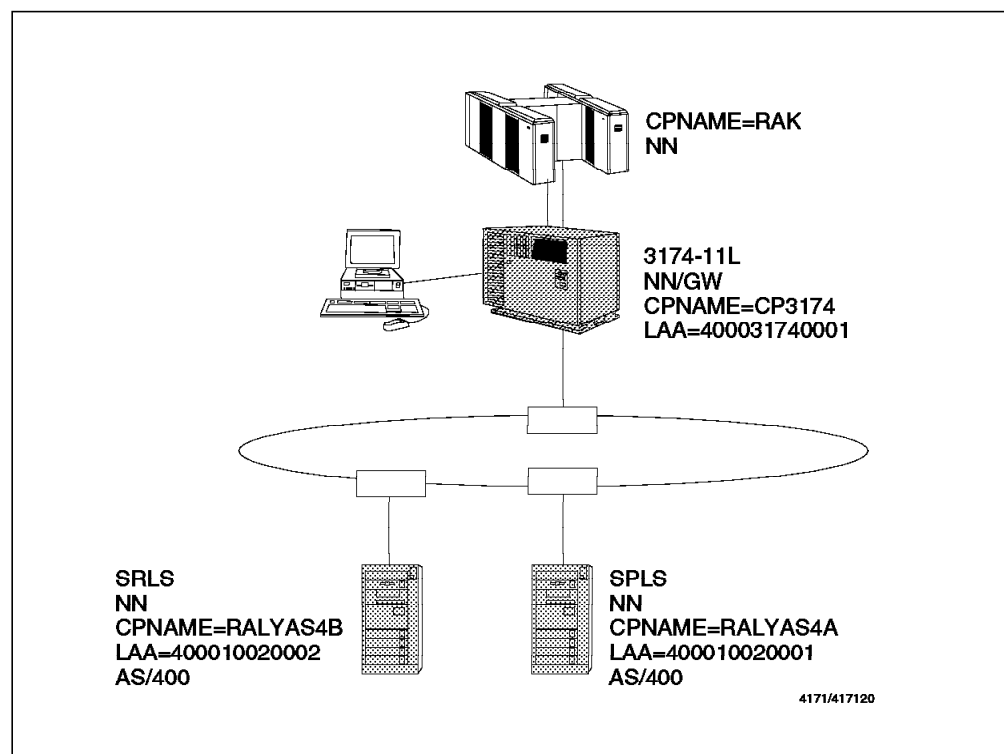


Figure 135. AS/400 Running SPLS Connected to VTAM via a 3174 GW

10.2 Definition Overview

The microcode level for the 3174 GW in this scenario is Configuration Support-C3. The 3174 must be configured as a gateway and network node to support SNA Primary LU2 on an AS/400 that is a DSPU to the 3174 gateway.

The AS/400 SPLS connection via a 3174 gateway requires some definitions attention.

- The 3174 does not support a pacing value of 0.
- The Configuration Support-C5 or Configuration Support-C3 with patch #AD2F (PTRAD2F) requires that the primary send window size (BIND, byte 12, bits 2-7), and the secondary receive window size (BIND byte 9, bits 2-7) have the same non-zero value. You have to add the following parameters in the LU definition for the 3270 LU or in the mode entry definition used when logging on to the LU supported by SNA Primary LU support via a 3174 GW:

PACING=(X,X,FIXED)

VPACING=(X,X,FIXED)

The value defined in the PACING and VPACING are compared to the value defined for the ILU. They must match the ILU values or be smaller (see Figure 136 on page 169).

- The frame size and the RU size are important parameters:
 - Between AS/400 and the 3174 GW .

Because the AS/400 acts as a primary LU to the 3174 GW, if the value of the primary RU size (BIND, byte 11) and the AS/400 frame size are greater than the 3174 token-ring frame size, the BIND will be rejected. But according to the SPLS AS/400 PTF level, the AS/400 will retry with a smaller value. The frame size for the AS/400 is defined in the line and controller description. See Figure 142 on page 173, parameter F for 3174 token-ring frame size.
 - Between 3174 GW and VTAM

The 3174 GW has default values for the frame size. The value for a channel-attached gateway is 4096 bytes, for a SDLC-attached gateway is 521 bytes, and for an ESCON-attached gateway is 8192 bytes.
 - VTAM value

In the VTAM definition for a locally-attached 3174, you have the parameter MAXBFRU. The number of MAXBFRU multiplied by the IOBUF value (VTAM startup definition) must be greater than the RU size. See Figure 136 on page 169 for values used in this scenario.
- Currently, the only link definition accepted for SPLS between the 3174 and the AS/400 is a link between network nodes without CP-CP sessions. All other definitions will give errors.
- When using different VTAMs, you have to define the mode name in the origin and destination VTAM. With the 3174 gateway between the AS/400 and VTAM, you have to define all mode names used in the Mode/COS Correlation panel. If you receive a sense code 08210002, check the mode/COS correlation table for the missing mode name. Figure 146 on page 174 shows the table and the mode names used during our test.

10.3 VTAM Definitions

```
*****
*                                                                 *
*                                                                 *
*   LOCAL 3174-11L DEFINITIONS FOR TYPE 2.1                     *
*                                                                 *
*                                                                 *
*****

LOC1121 VBUILD TYPE=LOCAL

*****
*                                                                 *
*   VTAM definition for the 3174 Gateway                         *
*                                                                 *
*****

RASPE40  PU      CUADDR=E40,PUTYPE=2,MAXBFRU=10,                *
                MODETAB=MTGS3X,DLOGMOD=EM3277,USSTAB=US327X,    *
                XID=YES,                                         *
                DYNLU=YES,                                       *
                VPACING=2,                                       *
                PACING=2                                         *

RAST4002 LU      LOCADDR=2
RAST4003 LU      LOCADDR=3
RAST4004 LU      LOCADDR=4
RAST4005 LU      LOCADDR=5

*****
*                                                                 *
*   VTAM definition for the AS/400 B                             *
*                                                                 *
*****

RASPE45  PU      CUADDR=E45,PUTYPE=2,MAXBFRU=10,                *
                MODETAB=AMODETAB,DLOGMOD=M2SDLCQ,USSTAB=US327X, *
                ISTATUS=ACTIVE,DYNLU=YES,                       *
                PACING=2,                                       *
                VPACING=2                                       *
*
RAST4502 LU      LOCADDR=2
RAST4503 LU      LOCADDR=3
RAST4504 LU      LOCADDR=4
RAST4505 LU      LOCADDR=5
RAST4540 LU      LOCADDR=64
```

Figure 136 (Part 1 of 2). VTAM Definitions for the 3174 Gateway

```

*****
*
* VTAM definition for the AS/400 A
*
*****

RASPE46 PU      CUADDR=E46,PUTYPE=2,MAXBFRU=10,
                SECNET=YES,ISTATUS=ACTIVE,
                MODETAB=MTGS3X,DLOGMOD=SNX32702,USSTAB=US327X,
                DYNLU=YES,
                VPACING=2,
                PACING=2
*
RAST4602 LU     LOCADDR=2
RAST4603 LU     LOCADDR=3
RAST4640 LU     LOCADDR=64

*****
*
* VTAM definition for the PS/2 CM/2
*
*****

RASPE47 PU      CUADDR=E47,PUTYPE=2,MAXBFRU=10,
                ISTATUS=ACTIVE,VPACING=2,
                MODETAB=MTGS3X,DLOGMOD=EM3277,USSTAB=US327X,
                PACING=2
*
RAST4702 LU     LOCADDR=2,MODETAB=MTGS3X,DLOGMOD=SD82
RAST4703 LU     LOCADDR=3

```

Figure 136 (Part 2 of 2). VTAM Definitions for the 3174 Gateway

10.4 3174 Definitions

The following section will cover the 3174 Gateway and APPN definitions required to run SPLS via a 3174 Gateway.

We will define:

- The channel link to the host
- The 3174 as a gateway and associated DSPUs
- The 3174 for APPN
 - Local Resources
 - Network Resources
 - COS/Modes

10.4.1 Defining 3174 Attachments

Channel link to the Host

```
_____ Model / Attach _____

098 - 3174C3

099 - 3174 11L APPN AND GATEWAY + Patch #AD2F

100 - 11L

101 - 5

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 137. GW 3174 Model/Attach Definitions

Channel and Subchannel Characteristics

```
_____ Local (SNA) _____

104 - 40 1    105 - 47 2    108 - 23N6503    110 - 2 0000    116 - 2_ __
121 - 01      123 - 0      125 - 00000000    126 - 00000000    127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0    138 - 0
141 - A      150 - 1 0 3    165 - 0      166 - A      168 - 0
173 - 00000000 175 -      179 - 0 0 0    190 - 00
213 - 1      215 - 40002    220 - 3
222 - 0      223 - 10      224 - 2      225 - 4
                242 - 1 4

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 138. GW 3174 Local SNA Definitions

1 The channel address of the 3174 is 40. **2** Subchannels 41 through 47 will be used to service the DSPUs.

3 The gateway function is enabled by setting Question 150=1 0.

4 To have a shared (T2.1/T2.0) link Q242 must be set and is satisfied if the host definition indicates XID=YES for the PU.

10.4.2 Enabling 3174 APPN

```

_____ Common SNA _____

500 - 0          501 - USIBMRA_  502 - CP3174__

APPN Support Fields:

510 - 1          511 - CP3174__  512 - CNET____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 139. GW 3174 Common SNA Definitions

10.4.3 Defining the LAN Address and DSPUs

Defining the 3174 LAN Address: In this scenario the 3174 is attached to an IBM Token-Ring Network.

```

_____ Common Network _____

900 - 4000 3174 0001 04  905 - 1          908 - IBMLAN

911 - 0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 140. GW 3174 Common Network Definitions

Definition of the Gateway DSPUs

```

_____ 940: Ring Address Assignment _____

S      Ring Address  SAP  T      S      Ring Address  SAP  T
40     4000 3174 0001  04      42     4000 3174 1992  04  0
41     4000 3174 0002  04  1      44     4000 3174 3992  04  0
43     4000 3174 2992  04  0      46     4000 1002 0001  04  1
45     4000 1002 0002  04  0
47     4000 3001 0025  04  0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 141. GW 3174 Ring Address Assignment Definitions


```

_____ 941: Ring Transmission Definition _____

S      Ring Address  SAP  F  W      S      Ring Address  SAP  F  W
40     4000 3174 0001  04          42     4000 3174 1992  04  0  2
41     4000 3174 0002  04  3  2      44     4000 3174 3992  04  0  2
43     4000 3174 2992  04  0  2      46     4000 1002 0001  04  3  2
45     4000 1002 0002  04  3  2
47     4000 3001 0025  04  3  2

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu

```

Figure 142. GW 3174 Ring Transmission Definition

10.4.4 Defining 3174 APPN Resources

Defining Local APPN Node Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 1      611 NODES/LINKS - 1
612 WILDCARD - 0      613 HOST LINK - 1A

Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu

```

Figure 143. GW 3174 APPN Node Definition

Defining Adjacent Network Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUS*  DLC TYPE  ADDRESS  DLCI
        (1-4)    (X)    (1-5)
1  RALYAS4A  3  1  1  4000 1002 0001  04  ____
2  RALYAS4B  3  -  1  4000 1002 0002  04  ____

* - Enter 'X' to define Associated LUs where required.

PF:  3=Quit  4=Default 7=Back  8=Back 10=PageBk 11=PageFwd

```

Figure 144. GW 3174 Network Resource Definitions

1 NODE TYPE of 3 indicates that these are NNs.

2 DLC TYPE specifies the type of data link control protocol for the link. The response 1 indicates that the node is attached to a LAN (token-ring or Ethernet). In this scenario the 3174 is attached to an IBM Token-Ring Network.

10.4.5 Adding and Correlating Modes to COS

COS Definition

```
_____ COS Definition _____

Enter the number of the COS Definition.

COS Definition Number - ____

-----Definition Numbers-----

1. #BATCH_      8. _____
2. #BATCHSC     9. _____
3. #INTER_     10. _____
4. #INTERSC    11. _____
5. #CONNECT    12. _____
6. _____  13. _____
7. _____  14. _____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 145. GW 3174 COS Definitions

Mode/COS Correlation

```
_____ Mode/COS Correlation _____

Mode Name # COS Name      Mode Name # COS Name
#BATCH_   _ #BATCH_      SD82_     _ #CONNECT
#BATCHSC  _ #BATCHSC     EM3277X_  _ #CONNECT
#INTER_   _ #INTER_      EM3277_   _ #CONNECT
#INTERSC  _ #INTERSC     EM3278_   _ #CONNECT
blank     _ #CONNECT     EM3279_   _ #CONNECT
QPCSUPP_  _ #CONNECT     SNX32702  _ #CONNECT
EXT32793  _ #CONNECT     EXT3278_  _ #CONNECT

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu
```

Figure 146. GW 3174 Mode/COS Correlation Definitions

We have coded several host modes to allow connection for several logmodes.

10.5 AS/400 Definitions

On the AS/400 we do the following:

- Define the 3174 Controller since it is serving as a gateway and NN for the AS/400.
- Define the dependent device for SPLS.

10.5.1 AS/400 System A Definitions

Controller and Device Descriptions for the 3174

Display Controller Description		RA
		05/30/94 10
Controller description	CP3174	
Option	*BASIC	
Category of controller	*HOST	
Link type	*LAN	
Online at IPL	*NO	
Active switched line	L41TR	
Character code	*EBCDIC	
Maximum frame size	16393	
Remote network identifier	USIBMRA	
Remote control point	CP3174	
Local exchange identifier	*LIND	
Initial connection	*DIAL	
Dial initiation	*LINKTYPE	
Switched disconnect	*NO	
LAN remote adapter address	400031740001	
LAN DSAP	04	
LAN SSAP	04	
Text	*BLANK	
APPN-capable	*YES	
APPN CP session support	*NO	
APPN node type	*NETNODE	
APPN transmission group number	1	
APPN minimum switched status	*VRYONPND	
Autocreate device	*ALL	
Autodelete device	1440	
User-defined 1	*LIND	
User-defined 2	*LIND	
User-defined 3	*LIND	

Figure 147. AS/400 A Controller Definitions for SNA Primary LU2 Support

Display Device Description		RA
		05/30/94 10
Device description	RAST4640A	
Option	*BASIC	
Category of device	*DSP	
Device class	*RMT	
Device type	3279	
Device model	0	
Local location address	40	
Online at IPL	*YES	
Attached controller	CP3174	
Keyboard language type	USB	
Drop line at signoff	*YES	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSPRT	
Library	*LIBL	
Maximum length of request unit	*CALC	
Inactivity timer	1	
Application type	*CTLSSN	
Local location	RALY3174	
Workstation customizing object	*NONE	
Text	Device *ctlssn for SPLS	

Figure 148. AS/400 Device *CTLSSN Definitions for SNA Primary LU2 Support

10.5.2 AS/400 System B Definitions

Controller and Device Descriptions for the 3174

Display Controller Description		RA
		05/30/94 10
Controller description	CP3174	
Option	*BASIC	
Category of controller	*HOST	
Link type	*LAN	
Online at IPL	*NO	
Active switched line	L41TR	
Character code	*EBCDIC	
Maximum frame size	16393	
Remote network identifier	USIBMRA	
Remote control point	CP3174	
Local exchange identifier	*LIND	
Initial connection	*DIAL	
Dial initiation	*LINKTYPE	
Switched disconnect	*NO	
LAN remote adapter address	400031740001	
LAN DSAP	04	
LAN SSAP	04	
Text	*BLANK	
APPN-capable	*YES	
APPN CP session support	*NO	
APPN node type	*NETNODE	
APPN transmission group number	1	
APPN minimum switched status	*VRYONPND	
Autocreate device	*ALL	
Autodelete device	1440	
User-defined 1	*LIND	
User-defined 2	*LIND	
User-defined 3	*LIND	

Figure 149. AS/400 B Controller Definitions for SNA Primary LU2 Support

Display Device Description		RA
		05/30/94 10
Device description	RAST4540A	
Option	*BASIC	
Category of device	*DSP	
Device class	*RMT	
Device type	3279	
Device model	0	
Local location address	40	
Online at IPL	*YES	
Attached controller	CP3174	
Keyboard language type	USB	
Drop line at signoff	*YES	
Print device	*SYSVAL	
Output queue	*DEV	
Printer file	QSYSVRT	
Library	*LIBL	
Maximum length of request unit	*CALC	
Inactivity timer	1	
Application type	*CTLSSN	
Local location	RALY317B	
Workstation customizing object	*NONE	
Text	Device *ctlssn for SPLS	

Figure 150. AS/400 B Device *CTLSSN Definitions for SNA Primary LU2 Support

10.6 Verification from the Host Perspective

```
RAKAN    DISPLAY NET,ID=RASPE40,SCOPE=ALL
RAKAN    IST097I  DISPLAY  ACCEPTED
RAKAN
T075I    NAME = RASPE40                , TYPE = PU_T2.1
T486I    STATUS= ACTIV--L--, DESIRED STATE= ACTIV
T1043I   CP NAME = CP3174  , CP NETID = USIBMRA , DYNAMIC LU = YES
T136I    LOCAL   SNA MAJOR NODE = LOCE4V34
T077I    SIO = 01252 CUA = E40
T654I    I/O TRACE = OFF, BUFFER TRACE = OFF
T355I    LOGICAL UNITS:
T080I    RAST4002 ACT/S      RAST4003 ACT/S      RAST4004 ACTIV
T080I    RAST4005 ACTIV      RAST4006 ACTIV      RAST4007 ACTIV
T080I    RAST4008 ACTIV      RAST4009 ACTIV      RAST4010 ACTIV
T080I    RAST4011 ACTIV      RAST4012 ACTIV      RAST4013 ACTIV
T080I    RAST4014 ACTIV      RAST4015 ACTIV      RAST4016 ACTIV
T080I    RALY3174 ACT/S----Y RALY317B ACT/S----Y
T314I    END
```

Figure 151. NetView Display of the 3174 Gateway PU

```
C RAKAN    DISPLAY NET,ID=RAST4002,SCOPE=ALL
RAKAN    IST097I  DISPLAY  ACCEPTED
' RAKAN
IST075I   NAME = RAST4002                , TYPE = LOGICAL UNIT
IST486I   STATUS= ACT/S      , DESIRED STATE= ACTIV
IST977I   MDLTAB=***NA*** ASLTAB=***NA***
IST861I   MODETAB=AMODETAB USSTAB=US327X  LOGTAB=***NA***
IST934I   DLOGMOD=M2SDLCQ  USS LANGTAB=***NA***
IST597I   CAPABILITY-PLU INHIBITED,SLU ENABLED ,SESSION LIMIT 00000001
IST136I   LOCAL   SNA MAJOR NODE = LOCE4V34
IST135I   PHYSICAL UNIT = RASPE40 , CUA = E40
IST082I   DEVTYPE =                LU
IST654I   I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I   ACTIVE SESSIONS = 0000000001, SESSION REQUESTS = 0000000000
IST206I   SESSIONS:
IST634I   NAME      STATUS      SID      SEND RECV VR TP NETID
IST635I   RALY3174 ACTIV-P      F8D3D1642489D393      0 0 USIBMRA
IST314I   END
```

Figure 152. NetView Display of the 3174 Gateway LU RAST4002

```

C RAKAN    DISPLAY NET,ID=RAST4003,SCOPE=ALL
  RAKAN    IST097I  DISPLAY  ACCEPTED
' RAKAN
IST075I    NAME = RAST4003                , TYPE = LOGICAL UNIT
IST486I    STATUS= ACT/S                  , DESIRED STATE= ACTIV
IST977I    MDLTAB=***NA*** ASLTAB=***NA***
IST861I    MODETAB=AMODETAB USSTAB=US327X  LOGTAB=***NA***
IST934I    DLOGMOD=M2SDLCQ USS LANGTAB=***NA***
IST597I    CAPABILITY-PLU INHIBITED,SLU ENABLED ,SESSION LIMIT 00000001
IST136I    LOCAL   SNA MAJOR NODE = LOCE4V34
IST135I    PHYSICAL UNIT = RASPE40 , CUA = E40
IST082I    DEVTYPE = LU
IST654I    I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I    ACTIVE SESSIONS = 0000000001, SESSION REQUESTS = 0000000000
IST206I    SESSIONS:
IST634I    NAME      STATUS      SID      SEND RECV VR TP NETID
IST635I    RALY3174 ACTIV-P      F8D3D1642489D399      0 0 USIBMRA
IST314I    END

```

Figure 153. NetView Display of the 3174 Gateway LU RAST4003

```

C RAKAN    DISPLAY NET,ID=RALY3174,SCOPE=ALL
  RAKAN    IST097I  DISPLAY  ACCEPTED
' RAKAN
IST075I    NAME = RALY3174                , TYPE = CDRSC
IST486I    STATUS= ACT/S----Y, DESIRED STATE= ACTIV
IST977I    MDLTAB=***NA*** ASLTAB=***NA***
IST861I    MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I    DLOGMOD=M2SDLCQ USS LANGTAB=***NA***
IST597I    CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I    CDRSC   MAJOR NODE = ISTCDRDY
IST1044I   ALSLIST = RASPE40
IST082I    DEVTYPE = INDEPENDENT LU / CDRSC
IST654I    I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I    ACTIVE SESSIONS = 0000000003, SESSION REQUESTS = 0000000000
IST206I    SESSIONS:
IST1081I   ADJACENT LINK STATION = RASPE40
IST634I    NAME      STATUS      SID      SEND RECV VR TP NETID
IST635I    RAST4702 ACTIV-S      F8D3D1642489D39B      0 0 USIBMRA
IST635I    RAST4003 ACTIV-S      F8D3D1642489D399      0 0 USIBMRA
IST635I    RAST4002 ACTIV-S      F8D3D1642489D393      0 0 USIBMRA
IST314I    END

```

Figure 154. NetView Display of the 3174 Gateway LU RALY3174

```

RAKAN    DISPLAY NET,ID=RASPE46,SCOPE=ALL
RAKAN    IST097I  DISPLAY  ACCEPTED
RAKAN
ST075I    NAME = RASPE46                , TYPE = PU_T2
ST486I    STATUS= ACTIV                  , DESIRED STATE= ACTIV
ST136I    LOCAL   SNA MAJOR NODE = LOCE4V34
ST077I    SIO = 00020 CUA = E46
ST654I    I/O TRACE = OFF, BUFFER TRACE = OFF
ST355I    LOGICAL UNITS:
ST080I    RAST4602 ACTIV      RAST4603 NEVAC      RAST4640 ACTIV
ST314I    END

```

Figure 155. NetView Display of the AS/400 PU

```

C RAKAN      DISPLAY NET,ID=RAST4640,SCOPE=ALL
  RAKAN      IST097I  DISPLAY  ACCEPTED
' RAKAN
IST075I  NAME = RAST4640          , TYPE = LOGICAL UNIT
IST486I  STATUS= ACTIV          , DESIRED STATE= ACTIV
IST977I  MDLTAB=***NA*** ASLTAB=***NA***
IST861I  MODETAB=AMODETAB USSTAB=US327X  LOGTAB=***NA***
IST934I  DLOGMOD=M2SDLCQ  USS LANGTAB=***NA***
IST597I  CAPABILITY-PLU ENABLED ,SLU INHIBITED,SESSION LIMIT 00000001
IST136I  LOCAL      SNA MAJOR NODE = LOCE4V34
IST135I  PHYSICAL UNIT = RASPE46 , CUA = E46
IST082I  DEVTYPE =              LU
IST654I  I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I  ACTIVE SESSIONS = 0000000000, SESSION REQUESTS = 0000000000
IST172I  NO SESSIONS      EXIST
IST314I  END

```

Figure 156. NetView Display of the AS/400 SPLS LU

10.7 Verification from the 3174 Perspective

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
1	USIBMRA	RAK	WC	OPEN	08	0	NA
6	USIBMRA	RALYAS4B	NN	OPEN	08	0	NO
7	USIBMRA	RALYAS4A	NN	OPEN	08	0	NO
9	USIBMRA	CP31743	NN	OPEN	08	0	NO

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 157. Display Status of the 3174 Adjacent Nodes

10.8 Verification for the AS/400 Perspective

L41TR	ACTIVE			
CP3174	ACTIVE			
RAST4640A	VARIED ON			
RAST4602A	VARIED ON			
RAST464001	ACTIVE	RAST464001	QSECOFR	039768
RAST464002	VARY ON PENDING			
RAST464003	VARY ON PENDING			
RAST464004	VARY ON PENDING			
RAST464006	SIGNON DISPLAY			

Figure 158. AS/400 Controller Display Status

```

                                Display Device Description
Device description . . . . . : RAST464001
Option . . . . . : *BASIC
Category of device . . . . . : *DSP

Device class . . . . . : *RMT
Device type . . . . . : 3279
Device model . . . . . : 0
Local location address . . . . . : 00
Online at IPL . . . . . : *NO
Attached controller . . . . . : CP3174
Keyboard language type . . . . . : USB
Drop line at signoff . . . . . : *NO
Print device . . . . . : *SYSVAL
Output queue . . . . . : *DEV
Printer file . . . . . : QSYSPRT
Library . . . . . : *LIBL
Maximum length of request unit . . : *CALC
Inactivity timer . . . . . : 1
Application type . . . . . : *DEVINIT
Remote location . . . . . : RAST4002
Local location . . . . . : RALY3174
Remote network identifier . . . . : USIBMRA
Control session device . . . . . : RAST4640A
Workstation customizing object . . : *NONE
Text . . . . . : AUTOMATICALLY CREATED BY QLUS

```

Figure 159. AS/400 Device RAST4601 in Session

10.9 Prerequisites

For Configuration Support-C5 the following patches are installed in the 3174 to support SPLS.

```

                                Controller Vital Data
3174 TEST MACHINE ID 0001 RALEIGH ITSC

Model Number:      11L
Controller ID:     23AE106
Microcode Release: C0500
Maintenance Release: 94167
IML Drive/Type:    03/41

DSL Information:
3174 C05.00 94167
AAAA C05.00 94167
3173 C05.00 94167

Patches
AEFF1  AFE91  AC743
AEFF2  AFE92  B0751
AEFF3  AFEC1  B0391
AF502  AFF31  B0392
AF503  AFEF1  B0151
AF6B2  AFEF2  B0541
AFD91  B0741  B0551
AFDE1  AFF43  B0571
AF361  AFF44  B05D2
AFDA2  AF037  AFFF1

Active
RPQs

Location: _____

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 160. Patches for CS-C5 to Support SPLS

Chapter 11. RS/6000 NN via 3174-11L to RS/6000 NN

This scenario shows the capability of an RS/6000 NN utilizing a 3174 NN to communicate to another RS/6000 NN. Prior to AIX SNA Services Version 2 Release 1, the RS/6000 was limited to being an LEN node. The emphasis in this scenario is the support of APPN via AIX SNA Services V2R1 using a 3174 NN as a server.

A number of interesting points should be noted about this scenario:

- The 3174-11L network node server has its wildcard option disabled since VTAM Version 4 Release 1 is configured as an APPN node.
- Both RS/6000 NNs, and 3174 network nodes belong to the same network; that is, they use the same network ID.

11.1 Configuration

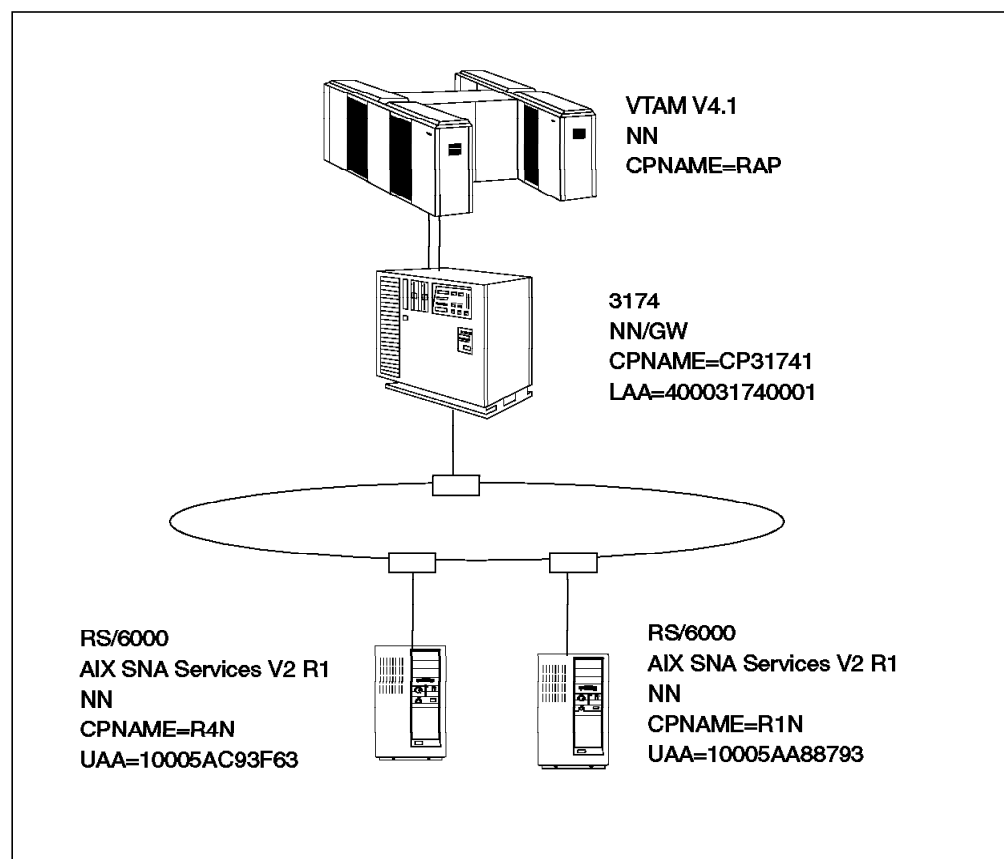


Figure 161. Scenario Configuration

11.2 Definition Overview

This scenario shows two RS/6000 NNs (R1N and R4N) attached to the same token-ring as a 3174 NN.

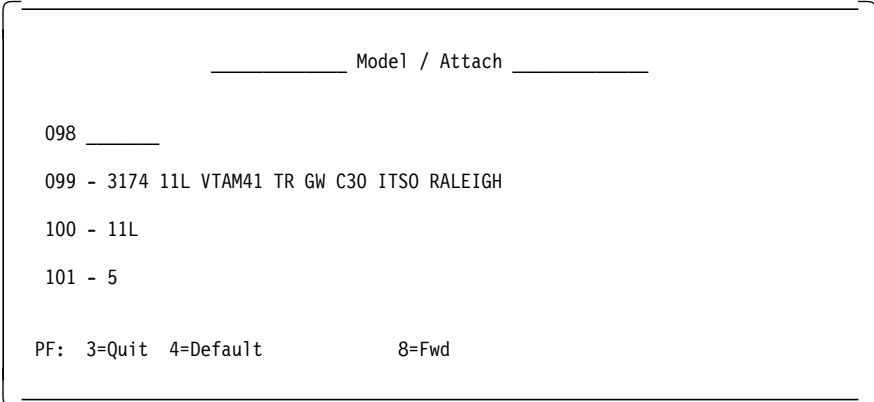
The composite network has the following components:

- An S/370 host with VTAM V4.R1
- 3174-11L (CP31741)
 - APPN NN
 - Token-ring gateway
- RS/6000 NN (R1N)
 - Token-ring address (10005AA88793)
- RS/6000 NN (R4N)
 - Token-ring address (10005AC93F63)

11.3 3174-11L Customization

In 3174-11L customization, we do the following:

- Enable the 3174-11L APPN functions
- Specify the 3174-11L network ID and control point name
- Define the RS/6000s as an NN node
- Specify the token-ring address for each RS/6000



```

_____ Model / Attach _____

098 _____
099 - 3174 11L VTAM41 TR GW C30 ITS0 RALEIGH
100 - 11L
101 - 5

PF: 3=Quit 4=Default          8=Fwd
```

Figure 162. 3174-11L Customization

11.3.1 Configuring the 3174 Host Attachment

Local (SNA)					LOCL
104 - 40 1	105 - 46 2	108 - 23N6233	110 - 1 0000	116 - 2_ _	
121 - 01	123 - 0	125 - 00000000	126 - 00000000	127 - 0 0	
132 - 0 0 0 0	136 - 1 0 0 1	137 - 0 0 0 0	138 - 0		
141 - A	150 - 1 0 3	165 - 1	166 - A	168 - 0	
173 - 00000000	175 -	179 - 0 0 0	190 - 00		
213 - 1	215 - 00000	220 - 3			
222 - 0	223 - 10	224 - 2	225 - 4		
		242 - 1			

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 163. Customizing the 3174-11L for a Local Token-Ring Gateway

1 Question 104 specifies the channel address of the 3174-11L as defined in VTAM. For our 3174-11L gateway, a channel address of 40 has been specified.

2 Question 105 defines the upper limit poll address for DSPUs. We will use the following subchannel polling addresses:

- **42** for the RS/6000 NN (R4N)
- **45** for the RS/6000 NN (R1N)

3 Question 150=1 0 enables the token-ring gateway function for DSPUs. Since we are using Configuration Support-C3, we must customize the 3174-11L as a gateway in order to customize the token-ring adapter. The RS/6000s are not using the 3174 as a gateway in this scenario, but we have customized the DSPU links for future use.

11.3.2 Common SNA

Common SNA			40/LOCL
500 - 0	501 - USIBMRA 1	502 - CP3174__	
APPN Support Fields:			
510 - 1 2	511 - CP31741_ 3	512 - CNET__	
PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH			

Figure 164. Names to Identify the 3174-11L Network Node

- 1** The 3174-11L is customized as being in network ID USIBMRA.
- 2** Question 510=1 enables the APPN functions.
- 3** Question 511 specifies the control point name used for the 3174-11L.

11.3.3 Common Network

Common Network			40/LOCL
900 - 4000 3174 0001 04 1	905 - 1	908 - IBMLAN	
911 - 0			
PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH			

Figure 165. Token-Ring Definition for the 3174-11L

- 1** Question 900 specifies the token-ring address of the 3174-11L.

11.3.4 Configuring the LAN Attachments

940: Ring Address Assignment							
S	Ring Address	SAP	T	S	Ring Address	SAP	T
40	4000 3174 0001	04		42	1000 5AC9 3F63 1	04	0
41	4000 3174 0002	04	1	44	4000 3174 3992	04	0
43	4000 3174 1992	04	0	46	4000 1002 0001	04	0
45	1000 5AA8 8793 2	04	0				
47	4000 3174 0003	04	1				

PF: 3=Quit 4=Default 7=Back 8=Fwd 9=RtnH

Figure 166. Ring Address Assignment

The RS/6000s are using the adapter burned-in addresses (Universally Administered Addresses):

- 1** 10005AC93F63 for the RS/6000 NN (R4N)
- 2** 10005AA88793 for the RS/6000 NN (R1N)

11.3.5 Defining the Adjacent Resources

Network Resources						
	CPNAME	NODE TYPE (1-4)	LUs (X)	DLC TYPE (1-3)	ADDRESS	
1	R1N	2 3	—	1	1000 5AA8 8793	04
2	R4N	2 3	—	1	1000 5AC9 3F63	04

PF: 3=Quit 4=Default 7=Back 8=Fwd 11=PageFwd

Figure 167. Network Resources

1 Both R1N and R4N (RS/6000) are defined as a NODE TYPE of 3, which is NN, and a DLC TYPE of 1, which is token-ring attached. We have defined R1N and R4N in the Network Resources, because they are NNs requiring a CP-CP session with the 3174 NN.

11.4 AIX SNA Services Configuration

In our scenario we have chosen to allow the 3174 to establish the link between it and the RS/6000. This means that the link, from the AIX SNA Services point of view, is dynamic. This means that we have very little to define for the RS/6000. We will need to:

- Provide the network ID.
- Provide the control point name (CPNAME).
- Define the node type.

11.4.1 SNA Global Information

Control point (CP) name	USIBMRA.R1N 1
CP alias	R1N
Node ID (for XID)	X'07100000' 2
Node type	Network node
Max. number of cached routing trees	500 3
Max. number of nodes in the TDB 4	500
Route additional resistance	128 (0-255) 5
Maximum number of sessions	200 6
Maximum number of conversations	200
Error logging enabled?	Yes 7
Implicit partner LU support?	Yes
NMVT action when no NMVT process	Reject
Control Point (CP) profile comment	APPN NW BY MIIKA AND HARALD
Time of last verified configuration	
Local hostname (TCP/IP)	rs60001
Product version	

Figure 168. SNA Global Information

- 1** Fully qualified CP name of the local node (network name, CP name)
- 2** XID changed by independent LUs
- 3** Maximum number of remote resources that can be listed in the local directory
- 4** TDB (topology database)
- 5** Desirability of using this node for intermediate session traffic
- 6** Both end point and intermediate sessions
- 7** /var/sna/snalog.1 or /var/sna/snalog.2

11.4.2 Active Links Information

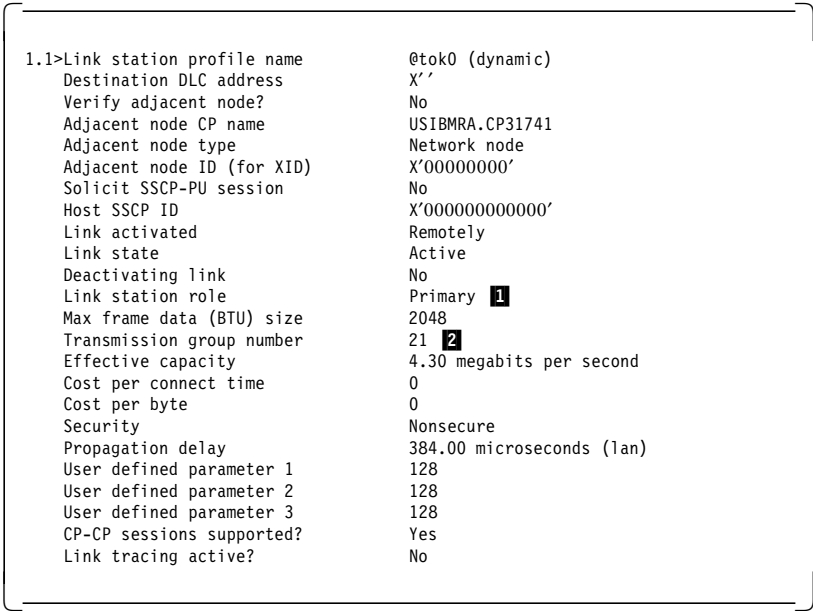


Figure 169. Active Links Information

- 1 Local station
- 2 Determined during line activation, unique to the particular TG, {21, 239} negotiated

11.4.3 Display LU 6.2 Session Information

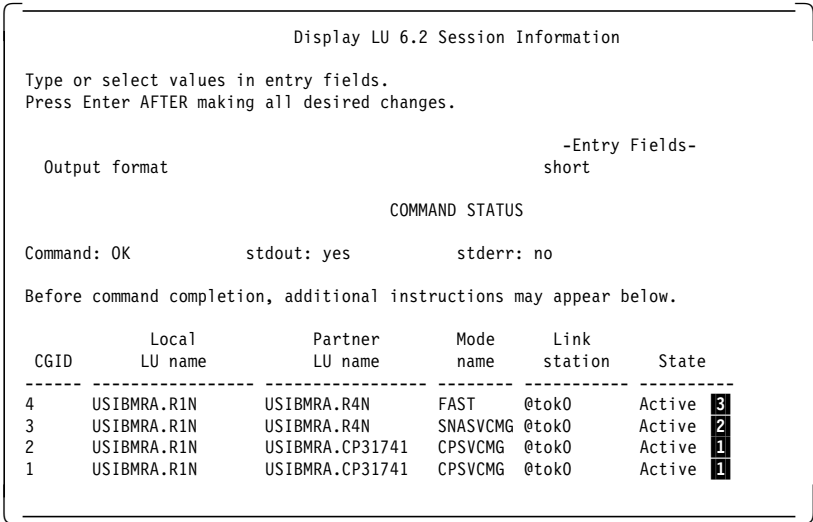


Figure 170. Display LU 6.2 Session Information

- 1 CP-CP sessions between R1N and CP31741 (Mode name is CPSVCMG).
- 2 SNASVCMG is used for SNA session negotiation.
- 3 Active LU 6.2 - LU 6.2 session with mode FAST defined by the user self.

11.4.4 LU 6.2 Session Information

LU - LU session	
Number of sessions	4
1>Session ID	X' E5C3EB5F465D386B'
Conversation group ID	4
Session status	Active
Link station profile name	@tok0 (dynamic)
LU type	6.2
Session type	Independent LU-LU session
LU alias	R1N
LU name	USIBMRA.R1N
Partner LU alias	R4N
Partner LU name	USIBMRA.R4N
Mode name	FAST
Symbolic destination name	CP12CP4 1
Send maximum RU size	4096
Receive maximum RU size	4096
Pacing type	Adaptive
Send pacing window	63
Receive pacing window	7
Outbound destination address (DAF)	X'02'
Outbound origin address (OAF)	X'02'
OAF-DAF assignor indicator (ODAI)	B'0'
Procedure correlator ID (PCID)	X' E5C3EB5F465D386B' 2
PCID generator CP name	USIBMRA.R1N
Host SSCP ID	(not applicable)
Primary LU	Local LU
Contention winner?	Yes 3
Session security supported?	No
2>Session ID	X' E5C3EB5F465D386A'
Conversation group ID	3
Session status	Active
Link station profile name	@tok0 (dynamic)
LU type	6.2
Session type	Independent LU-LU session
LU alias	R1N
LU name	USIBMRA.R1N
Partner LU alias	R4N
Partner LU name	USIBMRA.R4N
Mode name	SNASVCMG
Symbolic destination name	DYNAMIC-3- 1
Send maximum RU size	512
Receive maximum RU size	512
Pacing type	Adaptive
Send pacing window	63
Receive pacing window	7
Outbound destination address (DAF)	X'01'
Outbound origin address (OAF)	X'02'
OAF-DAF assignor indicator (ODAI)	B'0'
Procedure correlator ID (PCID)	X' E5C3EB5F465D386A' 2
PCID generator CP name	USIBMRA.R1N
Host SSCP ID	(not applicable)
Primary LU	Local LU
Contention winner?	Yes 3
Session security supported?	No

Figure 171 (Part 1 of 2). LU 6.2 Session Information

		CP - CP session
3>Session ID	X' E5C3EB5F465D3869'	
Conversation group ID	2	
Session status	Active	
Link station profile name	@tok0 (dynamic)	
LU type	6.2	
Session type	Independent LU-LU session	
LU alias	R1N	
LU name	USIBMRA.R1N	
Partner LU alias		
Partner LU name	USIBMRA.CP31741	
Mode name	CPSVCMG	
Symbolic destination name	DYNAMIC-2- 1	
Send maximum RU size	512	
Receive maximum RU size	512	
Pacing type	Adaptive	
Send pacing window	63	
Receive pacing window	7	
Outbound destination address (DAF)	X'00'	
Outbound origin address (OAF)	X'02'	
OAF-DAF assignor indicator (ODAI)	B'0'	
Procedure correlator ID (PCID)	X' E5C3EB5F465D3869' 2	
PCID generator CP name	USIBMRA.R1N	
Host SSCP ID	(not applicable)	
Primary LU	Local LU	
Contention winner?	Yes 3	
Session security supported?	No	
		CP - CP session
4>Session ID	X' EE4B7AFF00000005'	
Conversation group ID	1	
Session status	Active	
Link station profile name	@tok0 (dynamic)	
LU type	6.2	
Session type	Independent LU-LU session	
LU alias	R1N	
LU name	USIBMRA.R1N	
Partner LU alias		
Partner LU name	USIBMRA.CP31741	
Mode name	CPSVCMG	
Symbolic destination name	DYNAMIC-1- 1	
Send maximum RU size	512	
Receive maximum RU size	512	
Pacing type	Adaptive	
Send pacing window	63	
Receive pacing window	7	
Outbound destination address (DAF)	X'02'	
Outbound origin address (OAF)	X'00'	
OAF-DAF assignor indicator (ODAI)	B'1'	
Procedure correlator ID (PCID)	X' EE4B7AFF00000005' 2	
PCID generator CP name	USIBMRA.CP31741	
Host SSCP ID	(not applicable)	
Primary LU	Partner LU	
Contention winner?	No 3	
Session security supported?	No	

Figure 171 (Part 2 of 2). LU 6.2 Session Information

1 Link station name defined in RISC SYSTEM/6000.

2 To ensure uniqueness throughout the network, the FQPCID (fully qualified procedure correlation identifier) consists of a fixed-length (8-byte) PCID field.

3 This field indicates whether the local LU is the first "speaker".

11.4.5 Directory Information

Total directory entries	8
Network node entries	2
Local and adjacent node entries	0
1>Network node CP name	USIBMRA.R1N
Number of associated LUs	7
1.1>LU name	USIBMRA.R1NLU2
Owning CP name	USIBMRA.R1N
LU entry type	Home 1
1.2>LU name	USIBMRA.RA622220
Owning CP name	USIBMRA.R1N
LU entry type	Home
1.3>LU name	USIBMRA.R1NLU1
Owning CP name	USIBMRA.R1N
LU entry type	Home
1.4>LU name	USIBMRA.R1N
Owning CP name	USIBMRA.R1N
LU entry type	Home
1.5>LU name	USIBMRA.RS02TOK0
Owning CP name	USIBMRA.RS02TOK0
LU entry type	Home
1.6>LU name	USIBMRA.R4NLU1
Owning CP name	USIBMRA.R4N
LU entry type	Home
1.7>LU name	USIBMRA.R2LLU1
Owning CP name	USIBMRA.RS02TOK0
LU entry type	Home
2>Network node CP name	USIBMRA.R4N
Number of associated LUs	1
2.1>LU name	USIBMRA.R4N
Owning CP name	USIBMRA.R4N
LU entry type	Cache

Figure 172. Directory Information

1 Configured locally (home), registered by an adjacent node (register), or cached after the LU location was discovered by a previous search.

Chapter 12. Using DLUR with DDDL

This scenario examines using the 3174 DLUR function with the Dynamic Definition of Dependent LUs (DDL). This gives you the ability to define only the 3174 PU in the VTAM definitions and allows all LU (dependent as well as independent) definitions to be dynamically created on an as needed basis.

12.1 Configuration

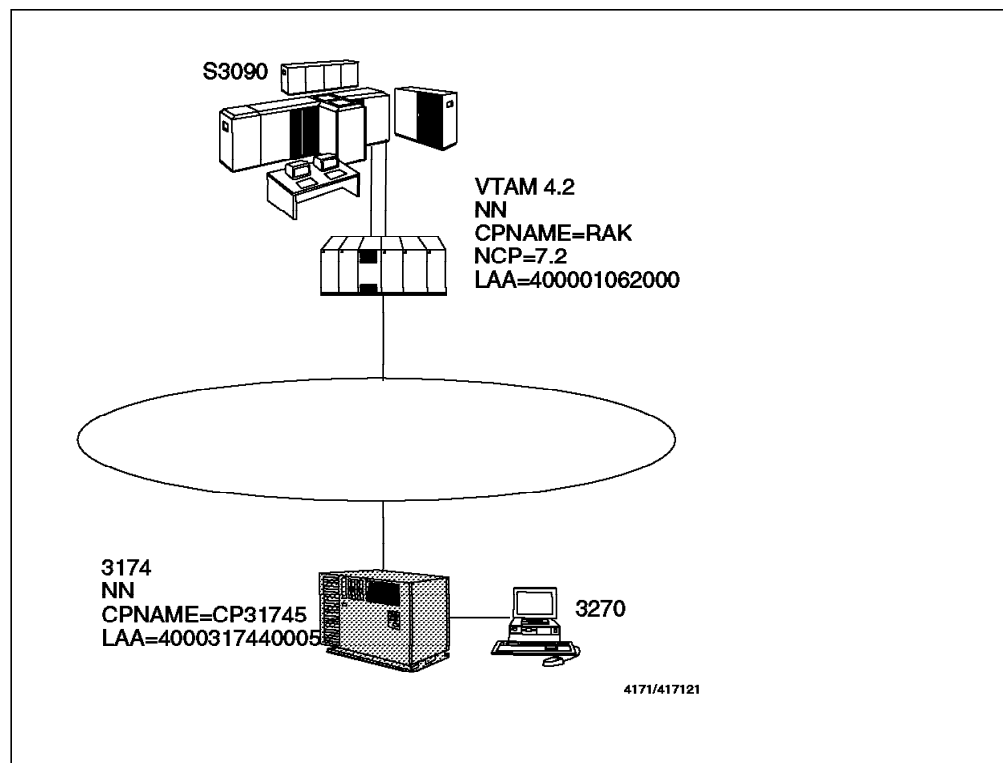


Figure 173. 3174 DLUR with DDDL to VTAM DLUS

12.2 Definition Overview

In this scenario we are using the 8250 Workstation Networking Module (Feature Number 3174). This is a 3174 blade for the IBM 8250 Intelligent HUB. It utilizes the token-ring backplane of the 8250 for LAN access. Currently there is no model that supports Ethernet.

VTAM/NCP

- Interchange node
- VTAM 4.2
- NCP 7.2
- CP name is RAK
- LAA 400001062000

- DDDL Exit
 - LU Group is LTMGRP
 - LU Seed is RAKLT###

8250 Workstation Networking Module (WNM)

- Configuration Support-C5
- Network Node/DLUR
- DSPU
- 3270 display on Port 0 and 8
- LAA is 400031740005
- Physical Unit ID is 31745

12.3 VTAM Customization

```
*****
*
*          VTAM SWITCHED MAJOR NODE FOR 3174 WNM USING DDDLU
*          and DLUR
*
*****
          VBUILD MAXGRP=1,
          MAXNO=1,
          TYPE=SWNET
*
* TEST MACHINE 2
*
WTSCLTM  PU      ADDR=13,
                  IDBLK=017,
                  IDNUM=31745, 1
                  LUGROUP=LTMGRP, 2
                  LUSEED=RAKLT###, 3
                  DISCNT=NO,
                  ISTATUS=ACTIVE,
                  MAXDATA=521,
                  MAXPATH=4,
                  PACING=0,
                  PUTYPE=2,
                  DLOGMOD=D4C32XX3,
                  MODETAB=ISTINCLM,
                  USSTAB=US327X,
                  VPACING=0
```

Figure 174. Switched Major Node 3174 WMN DLUR and DDDL

- 1 Physical Unit ID specified in 3174 Q215
- 2 LU Group Name to be used
- 3 LU Seed or Pool to be used

LU Group for DDDL

```

VBUILD TYPE=LUGROUP
LTMGRP 2 LUGROUP
3270004 LU      DLOGMOD=D4A32784,USSTAB=US327X
327000e LU      MODETAB=AMODETAB,DLOGMOD=D4C3COMP,USSTAB=US327X
@        LU      DLOGMOD=D4C32XX3,USSTAB=US327X

```

Figure 175. LU Group for DDDL U

12.4 3174 Customization

12.4.1 Defining the 3174 Attachments

Defining the Host Attachment

```
Online Test Password _____ Model / Attach _____
                                098 -

Product Assistance Data
099 - 3174 WNM WITH DLUR AND DDDLUR

3174 Model                      100 - 43R

Host Attachment                 101 - 7      1-BSC           6-SDLC, X.21 Switched
                                   2-SDLC           7-Token-Ring
                                   3-X.25          8-Ethernet
                                   4-Non-SNA Channel 9-Frame Relay
                                   5-SNA Channel   M-Multi-host

LAN adapter type                102 - 1      0-none
                                   1-Token-Ring
                                   2-Ethernet

NSO selection                   103 - 0000000000000000
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 176. Model/Attach Panel for 3174-43R WNM

Defining the Token-Ring LAN Attachment

```
Token-Ring Address _____ Token-Ring Description _____
                                080 - 4000 3174 0005

Token-Ring Speed                082 - 0      0- 4Mbps
                                   1-16Mbps

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 177. Token-Ring Description for 3174-43R

```
Local Area Network
106 - 4000 3174 0005 04 107 - 4000 0106 2000 04 108 - 00000000
110 - 1 0000 116 - 1 ____
121 - 01 123 - 0 125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0 138 - 0
141 - A 165 - 0 166 - A 168 - 0
172 - 0 173 - 00000000 175 - 179 - 0 0 0
213 - 1 215 - 31745 220 - 0
382 - 0521 383 - 2
385 - IBMLAN 386 - 1

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 178. LAN Attachment to Host Configuration

12.4.2 Enabling APPN

```

_____ Common SNA _____

500 - 0          501 - USIBMRA_  502 - _____

APPN Support Fields:

510 - 1          511 - CP31745_  512 - VNET3174

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 179. Common SNA Selection to Enable 3174 APPN

12.4.3 Defining the 3174 APPN Resources

Defining Local Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 2
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point 614-615
614 FP NAME - RALYAS4A    615 FP NETID - USIBMRA_

Report to Alert Focal Point 616
616 HOST LINKS - 1A _ _ _ _ _

DLUS Primary Host Name 620-621
620 CPNAME - RAK _ _ _    621 NETID - USIBMRA_

DLUS Backup Host Name 622-623
622 CPNAME - RAI _ _ _    623 NETID - USIBMRA_

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 180. 3174 APPN Node Definition

Defining Adjacent Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
      1-4      X      1-5

RAK_____  3      -      1      4000 0106 2000 04      _ _

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 181. Defining Adjacent Nodes

12.5 Verification at the 3174

Adjacent Nodes

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
2	USIBMRA	RAK	NN	OPEN	08	3	YES
10	USIBMRA	CP31741	NN	OPEN	08	0	NO

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test
PF: 3=Quit 5=Refresh 12=Test Menu

Figure 182. Test 17 Option 2 - Adjacent Nodes

Link Status to VTAM

Link Status						
NETID	CPNAME	Type	Status	State	Route Addition Resistance	
USIBMRA	RAK	NN	OPEN	08	128	
RCV Slam	SND Slam	Combined PU 2.0	Number APPN Sess	Congestion	Session Resource Depletion	
NA	NO	NO	3	NO	NO	
Adapter Type	Local Address	TG	HG	Remote Address	Product Information	
TR	400031740005	15	31	40000106200004	3745610	

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
PF: 3=Quit 5=Refresh 12=Test Menu

Figure 183. Test 17 Option 3 - Link Status to VTAM

Local LU6.2 Session Status

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
EE4B76FF3ECB8EC2	USIBMRA	CP31745	ACTIVE	02	CPSVCMG	RAK
F8D3D1647DD90F29	USIBMRA	RAK	ACTIVE	02	CPSVCMG	RAK
EE4B76FF3ECB8EC7	USIBMRA	CP31745	ACTIVE	02	SNASVCMG	RALYAS4A
EE4B76FF3ECB9262	USIBMRA	CP31745	ACTIVE	02	CPSVRMGR	RAK
F8D3D1647DD91464	USIBMRA	RAK	ACTIVE	02	CPSVRMGR	RAK

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 184. Test 17 Option 7 - LU 6.2 Session with 3174 End Point

Status Summary LU by Port

ID 1A LU Status Summary - HG 26																															
Port	00	02	04	06	08	10	12	14	16	18	20	22	24	26	28	30															
Address	01	03	05	07	09	11	13	15	17	19	21	23	25	27	29	31															
Terminal	v	?	?	?	?	?	?	v	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
LU																															

p = printer i = DFT device + = in session
v = video display e = DFTE device n = not 3174 managed
c = combination ? = unknown
g = 3174-Peer

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 5=Refresh 8=Fwd 12=Test Menu

Figure 185. Test 3 Option 1 - Status Summary for Direct Attached Devices

DLUR Connectivity for Port 0

```
_____ DLUR Connectivity for PN 00, HG 26 _____

Adapter HG status:      Enabled
Port PN status:        Powered on
Device type:           Video display MLT

Current connectivity-

      LT  LU Name  DLUS CPNAME      PLU CPNAME      PLU-SLU Link ID1
      1   RAKLT002  USIBMRA.RAK      Not active
      2           USIBMRA.RAK      Not active
      3           USIBMRA.RAK      Not active
      4           USIBMRA.RAK      Not active
      5           USIBMRA.RAK      Not active

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu
```

Figure 186. Test 3 Option 5 - DLUR Connectivity Prior to BIND for Port 0

DLUR Connectivity for Port 8

```
_____ DLUR Connectivity for PN 08, HG 26 _____

Adapter HG status:      Enabled
Port PN status:        Powered on
Device type:           Video display MLT

Current connectivity-

      LT  LU Name  DLUS CPNAME      PLU CPNAME      PLU-SLU Link ID1
      1   RAKLT010  USIBMRA.RAK      Not active
      2           USIBMRA.RAK      Not active
      3           USIBMRA.RAK      Not active
      4           USIBMRA.RAK      Not active
      5           USIBMRA.RAK      Not active

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu
```

Figure 187. Test 3 Option 5 - DLUR Connectivity Prior to BIND for Port 8

The PLU-SLU Link ID ¹ is not active since only the SSCP-LU session is active. Once a BIND is received, the PLU-SLU Link ID will be shown.

MLT Port Connectivity

```
_____ Connectivity for PN 00, HG 26 _____

Adapter HG status:      Enabled
Port PN  status:      Powered on
Device type:           Video display MLT

Current connectivity-
      LT   Bound   Host
      Addr  IDn    HG_PN  Host/Station Name
ACTIVE 1      No    002    1A1    31    3270 host
      2      No    034    1A2    31    3270 host
      3      No    035    1A3    31    3270 host
      4      No    036    1A4    31    3270 host
      5      No    037    1A5    31    3270 host

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu
```

Figure 188. Test 3 Option 3,0,26 - Connectivity for Port 0 with MLT

12.6 Verification at the Host

Switched Major Node for DDDLU and DLUR

```
NCCF                      N E T V I E W   RAKAN FRAN   12/05/94 09:25:22
C RAKAN  DISPLAY NET,ID=LTMDDL,SCOPE=ALL
  RAKAN  IST097I DISPLAY ACCEPTED
' RAKAN
IST075I  NAME = LTMDDL, TYPE = SW SNA MAJ NODE
IST486I  STATUS= ACTIV, DESIRED STATE= ACTIV
IST084I  NETWORK NODES:
IST089I  WTSCLTM TYPE = PHYSICAL UNIT, ACTIV
IST089I  RAKLT010 TYPE = LOGICAL UNIT, ACT/S---X-
IST089I  RAKLT002 TYPE = LOGICAL UNIT, ACTIV---X-
IST314I  END
-----
```

Figure 189. NetView Display of Switched Major Node

Display of the 3174 PU and LUs

```
NCCF                      N E T V I E W   RAKAN FRAN   12/05/94 09:26:15
C RAKAN  DISPLAY NET,ID=WTSCLTM,SCOPE=ALL
  RAKAN  IST097I DISPLAY ACCEPTED
' RAKAN
IST075I  NAME = WTSCLTM, TYPE = PU_T2
IST486I  STATUS= ACTIV, DESIRED STATE= ACTIV
IST1058I MODEL LU GROUP = LTMGRP, LUSEED = RAKLT###
IST1043I CP NAME = ***NA***, CP NETID = USIBMRA, DYNAMIC LU = YES
IST1354I DLUR NAME = CP31745, MAJNODE = LTMDDL
IST136I  SWITCHED SNA MAJOR NODE = LTMDDL
IST654I  I/O TRACE = OFF, BUFFER TRACE = OFF
IST355I  LOGICAL UNITS:
IST080I  RAKLT010 ACT/S---X- RAKLT002 ACTIV---X-
IST314I  END
-----
```

Figure 190. NetView Display of 3174 PU

Display of LU Group

```

NCCF                      N E T V I E W   RAKAN FRAN   12/05/94 09:27:08
C RAKAN   DISPLAY NET,ID=LTMLUGR,SCOPE=ALL
  RAKAN   IST097I  DISPLAY  ACCEPTED
' RAKAN
IST1060I  LUGROUP MAJOR NODE = LTMLUGR
IST075I   NAME = LTMGRP           , TYPE = MODEL LU GROUP
IST355I   LOGICAL UNITS:
IST080I   3270004                32700@                @
IST314I   END
-----

```

Figure 191. NetView Display of LU Group for DDDL U

Display Topology Database for CP31745

```

NCCF                      N E T V I E W   RAKAN FRAN   12/05/94 09:39:58
* RAKAN   D NET,TOPO,ID=CP31745,LIST=ALL
  RAKAN   IST097I  DISPLAY  ACCEPTED
' RAKAN
IST350I   DISPLAY TYPE = TOPOLOGY
IST1295I  CP NAME      NODETYPE  ROUTERES  CONGESTION  CP-CP  WEIGHT
IST1296I  USIBMRA.CP31745  NN      128      NONE        *NA*   *NA*
IST1297I          ICN/MDH  CDSERVR  RSN          *NA*   *NA*
IST1298I          NO      NO      5246
IST1223I          BN      NATIVE
IST1224I          NO      YES
IST1299I  TRANSMISSION GROUPS ORIGINATING AT CP USIBMRA.CP31745
IST1357I          CPCP
IST1300I  DESTINATION CP  TGN      STATUS  TGTYPE    VALUE  WEIGHT
IST1301I  1 USIBMRA.VNET3174  0      OPER   INTERM    YES    *NA*
IST1301I  USIBMRA.RAK      22      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.RAI      21      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.CP31741  21      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.CP31742  21      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.CP31745X  0      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.RAB      21      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.RAI      22      INOP    INTERM    YES    *NA*
IST1301I  2 USIBMRA.RAK      21      OPER   INTERM    YES    *NA*
IST1301I  USIBMRA.RALYAS4A  1      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.RALYAS4A  21      INOP    INTERM    YES    *NA*
IST1301I  USIBMRA.RALYAS4B  1      INOP    INTERM    YES    *NA*
IST314I   END
-----

```

???

Figure 192. NetView Display of the Topology for CP31745

Only two connections are operational:

- 1 USIBMRA.VNET3174, which is the Virtual Node (Connection Network) link
- 2 USIBMRA.RAK, which is the connection to the host

Chapter 13. DLUR-DLUS and PLU on the Same Host

This scenario is used to demonstrate the customization required to implement DLUR and DLUS with the 3174. We have used a similar hardware setup as that used in scenario Chapter 10, "SNA Primary LU2 Support (SPLS) via a 3174 GW" on page 167, in order to compare the various parameters. Note that SNA PassThrough is not implemented on the AS/400 this time; instead the AS/400 is configured as a network node. The host software, VTAM Version 4 Release 2, supports DLUS. This implementation allows concurrent support of dependent LUs together with independent LUs without the requirement of T2.0 traffic on the host link.

13.1 Configuration

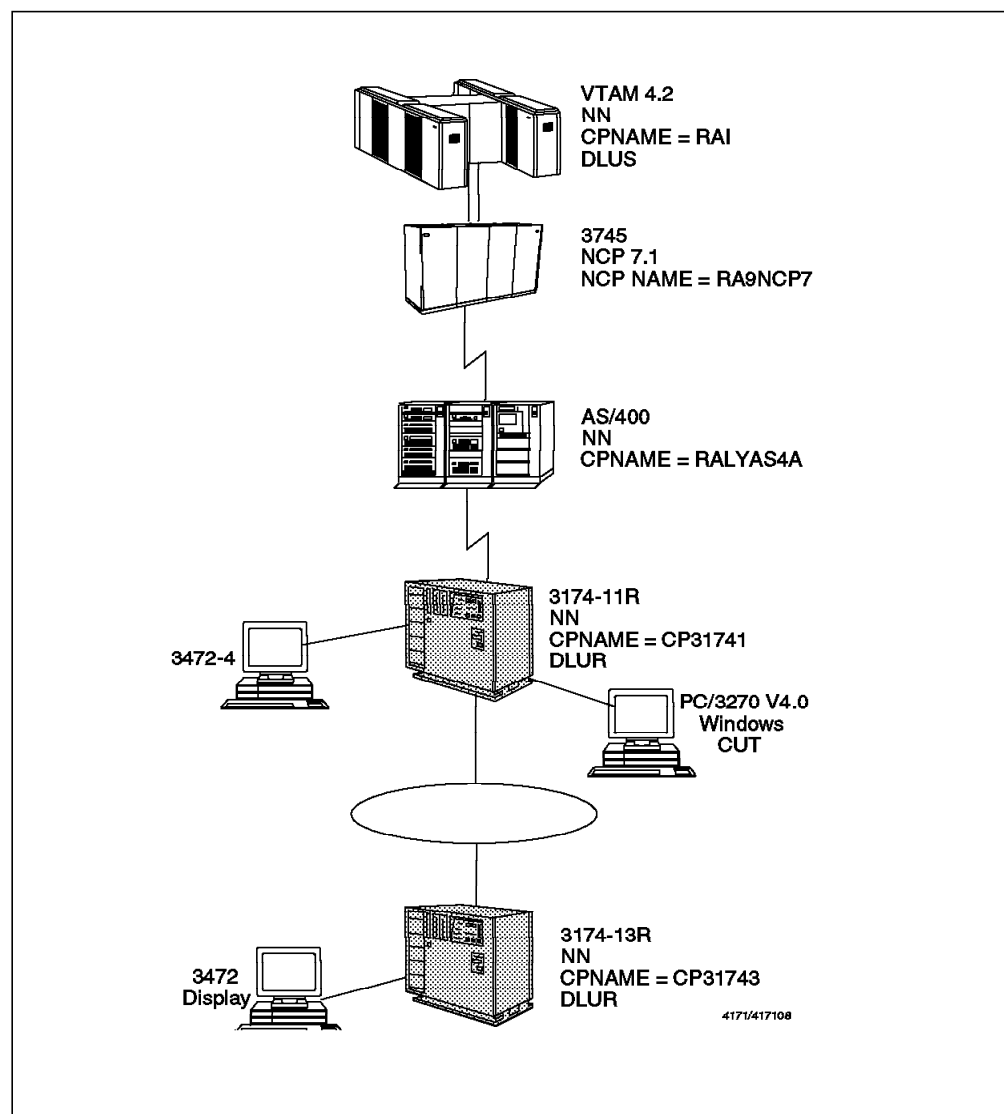


Figure 193. DLU to Host across APPN Network

13.2 Definition Overview

The additional definitions required to implement DLUR differ little from those used when implementing the 3174 as a network node in a traditional APPN network. If you are familiar with the APPN environment and the implementation with 3174s, there is only one additional panel requiring input that defines the DLUS host, Questions 620 to 623 on the APPN Node Definition panel. If only DLUR is to be implemented, the APPN definitions are minimal, as can be seen on the following pages.

In Figure 207 on page 210 you will notice that the VTAM definitions appear familiar. VTAM treats a DLUR PU as a switched PU and the definitions are coded accordingly. Indeed, if a suitable configuration services exit is in use, not even these definitions are required.

VTAM 4.2 in this scenario was configured as a network node and is currently the only product providing DLUS support.

The workstations used were 3472s. Any terminal or emulator providing 3270 support and currently supported in a dependent environment could be used.

A trace of the DLUR/DLUS activation process can be found in F.2, "Trace of DLUR/S Connection Flow" on page 482.

13.3 3174-11R Customization

In the 3174-11R we customize for the following:

- Define the Model and attachment types.
- Enable the 3174 APPN function.
- Define the DLUS host.
- Define the SDLC connection to the AS/400.
- Define the token-ring address to supply the downstream link to the 3174-13R.

13.3.1 Defining the 3174 Attachments

Defining the Model and Attachment Types

```

_____ Model / Attach _____

Online Test Password 1 098 -

Product Assistance Data
099 - 3174 TEST MACHINE ID 0001 RALEIGH ITSC

3174 Model 2 100 - 11R

Host Attachment      101 - 2  (1-BSC          6-SDLC, X.21 Switched
                             2-SDLC          7-Token-Ring
                             3-X.25         8-Ethernet
                             4-Non-SNA Channel 9-Frame Relay
                             5-SNA Channel  M-Multi-host)

LAN adapter type 3 102 - 1  (0-none
                             1-Token-Ring
                             2-Ethernet)

NSO selection      103 - 0000000000000000
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 194. Defining the Model and Attachment Type

1 A response to this question is optional. If you plan to use any of the Online Tests that require a password, a value must be coded here. Though previously customized, the password is not displayed.

2 Ensure the correct model is specified. In this scenario a 3174 11L (with Communication Adapter) was being used as a remote model 11R.

3 The LAN adapter in use is a token-ring. As a network node the 3174 has to have defined all communications adapters that will be used in the environment. Note that in this scenario the 3174 is *not* a gateway.

Describing the Token-Ring

```

_____ Token-Ring Description _____

Token-Ring Address 1 080 - 4000 3174 0001

Token-Ring Speed    082 - 0  (0- 4Mbps
                             1-16Mbps
                             2-16Mbps with early Token Release)

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 195. Defining the Token-Ring Attachment

1 Here we defined the locally administered address (LAA). The SAP is defined later in the customization. Permitted responses are the locally administered address (recommended), universal address (UAA), or all zeros.

If the universal address is explicitly coded it will have to be changed every time the token-ring adapter is replaced. A response of all zeros response will allow the universal address built in to the adapter to be used. The universal address can be displayed using the Offline Tests. See 3174 *Establishment Controller Maintenance Information*, SY27-2572 for details.

Defining the SDLC Link to the Host

SDLC

1 104 - C4	2 05 - 00	108 - 317411L	110 - 2 0000	3 116 - 1_
121 - 01	123 - 0	125 - 00000000	126 - 00000000	127 - 0
132 - 0 0 0 0	136 - 1 0 0 1	137 - 0 0 0 0	138 - 0	
141 - A	4 150 - 0 0	165 - 1	166 - A	168 - 0
172 - 0	173 - 00000000	175 -	179 - 0 0 0	190 - 00
213 - 1	215 - 31741	220 - 0		
5 310 - 0	5 313 - 1	5 317 - 0	5 318 - 0	340 - 0
365 - 0	6 370 - 1			

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 196. Defining the SDLC Host Attachment

The customization here is for an SDLC-attached controller with dependent devices attached.

- 1** C4 is the line address used by the AS/400.
- 2** There is only one address assigned to this 3174 as it is a network node (not a gateway).
- 3** We assigned the number of addresses per port manually, as we were not using DLUR-DLUS routing.
- 4** The controller is *not* a gateway, Question 150 = 0 0.
- 5** These parameters, relating to line characteristics, must match the coding on the attached device (in our case the AS/400). See Figure 208 on page 211.
- 6** It is important to define Question 370=1 to allow inbound RU size up to 512 bytes as binds may be longer than 256 bytes and cannot be reassembled by NCP.

13.3.2 Enabling 3174 APPN

Common SNA Panel

```
_____ Common SNA _____

500 - 0      1 501 - USIBMRA      502 - _____

APPN Support Fields:

2 510 - 1      3 511 - CP31741_      512 - VN3174

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 197. The Common SNA Panel

- 1** USIBMRA is the NETID of the whole network used in this scenario.
- 2** A response of 1 enables the APPN function.
- 3** This is the CPNAME of the 3174. Each CPNAME must be unique within a network.

13.3.3 Defining the LAN Network Common Parameters

Common Network Panel

```
_____ Common Network _____

1 900 - 4000 3174 0001 04      905 - 1      908 - IBMLAN

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 198. The Common Network Panel

- 1** The MAC address here is taken from Question 080 on the Token Ring Description panel and cannot be altered; only the SAP is defined here.

13.3.4 Defining the 3174 APPN Resources

Defining Local Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 3          611 NODES/LINKS - 1
612 WILDCARD - 0          613 HOST LINK - 1A
Alert Focal Point(614-615)
614 FP NAME - _____ 615 FP NETID - _____
Report to Alert Focal Point(616)
616 HOST LINKS - _ _ _ _ _
DLUS Primary Host Name(620-621)
1 620 CPNAME - RAI          621 NETID - USIBMRA
DLUS Backup Host Name(622-623)
2 622 CPNAME -             623 NETID -
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 199. The APPN Node Definition Panel

- 1 RAI is the CPNAME of the DLUS.
- 2 No backup DLUS is available in this scenario.

Defining Adjacent Nodes Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
      (1-4)  (X)  (1-5)
1 1 CP31743_ 2 3 _ 3 1 4000 3174 0003 04 _ _

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 200. The Network Resources Panel

- 1 Only the CP names of adjacent nodes requiring CP-CP sessions (or that the link be initiated by the 3174) need to be defined on this panel. The 3174-11R will initiate a CP-CP session with the 3174-13R (CP31743). The CP-CP session between the 3174-11R and the AS/400 is initiated by the AS/400, thus does not need to be defined on this panel.
- 2 A response of 3 defines the attached 3174 as a network node.
- 3 The link is a token-ring (indicated by a response of 1).

13.4 3174-13R Customization

The 3174-13R is customized as a network node, as is the 3174-11R. There are no attached PUs or independent LUs in our scenario.

13.4.1 Defining 3174 Attachment

```

_____ Model / Attach _____

Online Test Password   098 -

Product Assistance Data
099 - 3174-13R TEST ENVIRONMENT RALEIGH ITSC

3174 Model             100 - 13R

Host Attachment        101 - 7  (1-BSC           6-SDLC, X.21 Switched
                                2-SDLC           7-Token-Ring
                                3-X.25           8-Ethernet
                                4-Non-SNA Channel 9-Frame Relay
                                5-SNA Channel   M-Multi-host)

LAN adapter type       102 - 1  (0-none
                                1-Token-Ring
                                2-Ethernet)

NSO selection          103 - 0000000000000000
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 201. The First Customization Panel

Defining Token-Ring Attachment and Speed

```

_____ Token-Ring Description _____

Token-Ring Address 1 080 - 4000 3174 0003

Token-Ring Speed      082 - 0  (0- 4Mbps
                                1-16Mbps
                                2-16Mbps with early Token Release)

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 202. The Token-Ring Description Panel

1 This input is taken and used in Question 106 on the Local Area Network screen. The SAP is not defined here.

Defining Local Area Network

```

_____ Local Area Network _____

1 106 - 4000 3174 0003 04 2 107 - 4000 3174 0009 04 108 - 00000000
110 - 2 0000 116 - 1_ __
121 - 01 123 - 0 125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0 138 - 0
141 - A 165 - 0 166 - A 168 - 0
172 - 0 173 - 00000000 175 - 179 - 0 0 0
213 - 1 215 - 31743 220 - 0
382 - 0265 383 - 2
385 - 31743 386 - 1

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 203. The Local Area Network Panel 3174-13R

1 During customization, the question will be automatically filled in with your response to Question 080. Only the SAP needs to be added here.

2 This gateway does not exist in our scenario; however, input to this field is necessary during customization.

13.4.2 Enabling APPN

```

_____ Common SNA _____

500 - 0 501 - USIBMRA_ 502 - _____

APPN Support Fields:
1 510 - 1 2 511 - CP31743_ 512 - VN3174

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 204. The Common SNA Panel 3174-13R

1 As with the 3174-11R, the APPN function is enabled.

2 CP31743 is the unique control point name.

13.4.3 Defining the 3174 APPN Resources

Defining Local Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 1          611 NODES/LINKS - 1
612 WILDCARD - 0          613 HOST LINK - 1A
Alert Focal Point(614-615)
614 FP NAME - _____ 615 FP NETID - _____
Report to Alert Focal Point(616)
616 HOST LINKS - _ _ _ _ _
DLUS Primary Host Name(620-621)
1 620 CPNAME - RAI _____ 621 NETID - USIBMRA
DLUS Backup Host Name(622-623)
622 CPNAME - _____ 623 NETID - _____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 205. The APPN Node Definition Panel 3174-13R

1 The DLUS host is specified here together with its NETID.

Defining Adjacent Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
      (1-4)  (X)  (1-5)
1 1 CP31741_  3    -    1    4000 3174 0001 04  _ _

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 206. The Network Resources Panel 3174-13R

1 A CP-CP session is required with CP31741 so we define it here.

13.5 NCP Definition for the SDLC Attached AS/400

You can see the NCP/VTAM Line, PU, and LU definition to the AS/400 in Figure 75 on page 131.

13.6 VTAM Definitions

```
*          DLUR / DLUS          *
*****
SW31743  VBUILD MAXGRP=5,          X
          MAXNO=12,                X
          MAXDLUR=4, 1             X
          TYPE=SWNET
**
*-----PU AND LU'S DEFINITION FOR CP31743-----
**
SW31743P PU  ADDR=C1,              X
          MAXDATA=521,             X
          DISCNT=NO,               X
          MAXOUT=7,                X
          NETID=USIBMRA,           X
          CONNTYPE=APPN,           X
          IDBLK=017,               X
          IDNUM=31743,             X
          MAXPATH=2,               X
          CPNAME=CP31743,          X
          PACING=(7,1),             X
          VPACING=8,               X
          PUTYPE=2,                 X
          ISTATUS=ACTIVE
SW31743H PATH  DLCADDR=(1,C,INTPU),DLCADDR=(2,X,01731743), 2 X
          DLURNAME=CP31743,        X
          PID=1,                   X
          USE=YES                   INITIALY ACTIVE
**
*-----DLUR DEFINITION -----
**
S3174105 LU  LOCADDR=5,MODETAB=AMODETAB,USSTAB=US327X,
          DLOGMOD=DLUR,ISTATUS=ACTIVE
S3174122 LU  LOCADDR=22,MODETAB=AMODETAB,USSTAB=US327X,
          DLOGMOD=DLUR,ISTATUS=ACTIVE
S3174123 LU  LOCADDR=23,MODETAB=AMODETAB,USSTAB=US327X,
          DLOGMOD=DLUR,ISTATUS=ACTIVE
S3174124 LU  LOCADDR=24,MODETAB=AMODETAB,USSTAB=US327X,
          DLOGMOD=DLUR,ISTATUS=ACTIVE
S3174125 LU  LOCADDR=25,MODETAB=AMODETAB,USSTAB=US327X,
          DLOGMOD=DLUR,ISTATUS=ACTIVE
-----
DLUR      MODEENT LOGMODE=DLUR,FMPROF=X'03',TSPROF=X'03', X
          PRIPROT=X'B1',SECPRROT=X'90',COMPROT=X'3080', X
          SSNDPAC=X'01',PSNDPAC=X'01', X
          RUSIZES=X'8587',PSERVIC=X'028000000000185000007E00'
```

Figure 207. VTAM Switch Major Node Definiton for DLUR

DLUR resources are treated as switched resources. The MAXDLUR **1** parameter on the VBUILD tells VTAM how many DLUR definitions are about to be defined. This parameter works the same way as MAXNO and MAXGRP. The PU statement still requires ADDR and either CPNAME or IDBLK/IDNUM to be acceptable to VTAM. However, the ADDR is ignored and the CPNAME and node ID are specified in the PATH. We, therefore, code a dummy ADDR and CPNAME on this PU statement. The IDBLK/IDNUM, however, is used by VTAM to select which major node to use when DLUR/S connection is initiated by the DLUR via the encapsulated REQACTPU.

The PATH statement gives VTAM sufficient information to identify the PU to the DLUR. It tells VTAM what to send to the DLUR in the 91 and 92 (and 93 if present) subvectors in the CV46 in the encapsulated ACTPU. This is accomplished via the DLCADDR **2** parameter. The LUs are coded as normal.

The switch major node has to be activated first to VTAM before the 3174 initiates a DLUR/DLUS connection. Otherwise, a dynamic PU session initiation is to be implemented together with the ISTECCS exit.

Note that most NNs require some type of pacing in both directions (PLU-SLU and SLU-PLU) for LU-LU sessions routing through them. If you have an intermediate NN between the DLUS and DLUR, a non-zero value must be coded for the VPACING parameter on the APPL macro definition for the application. Also, a non-zero value must be specified in the SSNDPAC parameter in the logmode that is used for the dependent LUs.

13.7 AS/400 Definitions

Line description>LIN3174C1	Controller description>CTL3174C1
Resource names LIN061	Online at IPL *YES
Online at IPL *YES	APPN-capable *YES 1
NRZI data encoding *YES	4 Character code *EBCDIC
Maximum controllers 1	Maximum frame size 521 7
Clocking *MODEM	Remote network identifier . . . USIBMRA 5
Line speed 9600	Remote control point CP31741 1
Modem type supported . . . *NORMAL	SSCP identifier *SAME
Modem data rate select . . *FULL	Station address C4 6
Maximum frame size 521	SDLC poll priority *NO
Error threshold level . . . *OFF	SDLC poll limit 0
Duplex *HALF	SDLC out limit *POLLMT
Modulus 8	SDLC connect poll retry . . . *NOMAX
Maximum outstanding frames 7	SDLC NDM poll timer *CALC
Inactivity timer 300	APPN CP session support . . . *YES 3
Poll response delay 0	APPN node type *NETNODE 2
Nonproductive receive . . . 320	APPN transmission group number *CALC
Idle timer 30	APPN minimum switched status . *SAME
Connect poll timer 30	Autodelete device 1440
Poll cycle pause 0	User-defined 1 *LIND
Frame retry 7	User-defined 2 *LIND
Data Set Ready drop timer 6	User-defined 3 *LIND
Autoanswer type *DTR	Recovery limits:
Clear To Send timer 25	Count limit 2
Remote answer timer 60	Time interval 5
Link speed 9600	Text 'description' *BLANK
Cost/connect time 0	
Cost/byte 0	
Security for line *NONSECURE	
Propagation delay *TELEPHONE	
User-defined 1 128	
User-defined 2 128	
User-defined 3 128	
Recovery limits:	
Count limit 2	
Time interval 5	
Text 'description' *BLANK	

Figure 208. Line and Controller Definitions for CP31741

This figure shows the Line and Controller definitions for the SDLC connected to 3174. CP31741 **1** is defined in this link as a network node **2** and needs to have CP-CP session capability configured **3**. Other parameters that require matching with 3174 are as follows:

- NRZI Coding with Question 313 **4**
- Station Address with Question 104 **6**
- Remote Network Identifier with Question 501 **5**
- Maximum Frame Size with Question 370 **7**

If the AS/400 is connected as a network node in between the DLUR and DLUS as in our scenario, PTF MF07043 for VRM220 or MF07044 for VRM230 should be applied. Otherwise, you will get a sense 8004000 link error problem once the bind starts to flow from the application going to the 3174 during logon.

13.8 Activation

DLUR/DLUS connection can be initiated either from VTAM or a 3174. If the DLUS name is configured at the 3174, the 3174 will initiate the pipe when IML is complete and a physical connection has been established to another APPN node. If the DLUS is adjacent to the 3174, a BIND request with a mode of CPSVRMGR is sent. When a positive response (+rsp) to the BIND is received, the 3174 will send a REQACTPU to the DLUS. If the DLUS is not adjacent, the 3174 will send a LOCATE FIND request in order to establish a route to the DLUS. When a LOCATE FOUND response is received, flows continue as is the case when DLUR and DLUR are adjacent. To initiate the pipe from VTAM, a VARY NET, DIAL command to the PU is issued after the switched major node has been activated. VTAM will send a LOCATE FIND followed by BIND for CPSVRMGR session connection. This CPSVRMGR pipe will then be used by VTAM to send this encapsulated ACTPU and ACTLU requests for the SSCP-PU and SSCP-LU session establishments.

In this section, the switched major node is activated first, followed by an IML of the 3174 with DLUS coded. This makes the 3174 initiate the DLUR/DLUS connection. Figure 209 on page 213 shows a summary of the CPSVRMGR session flows.

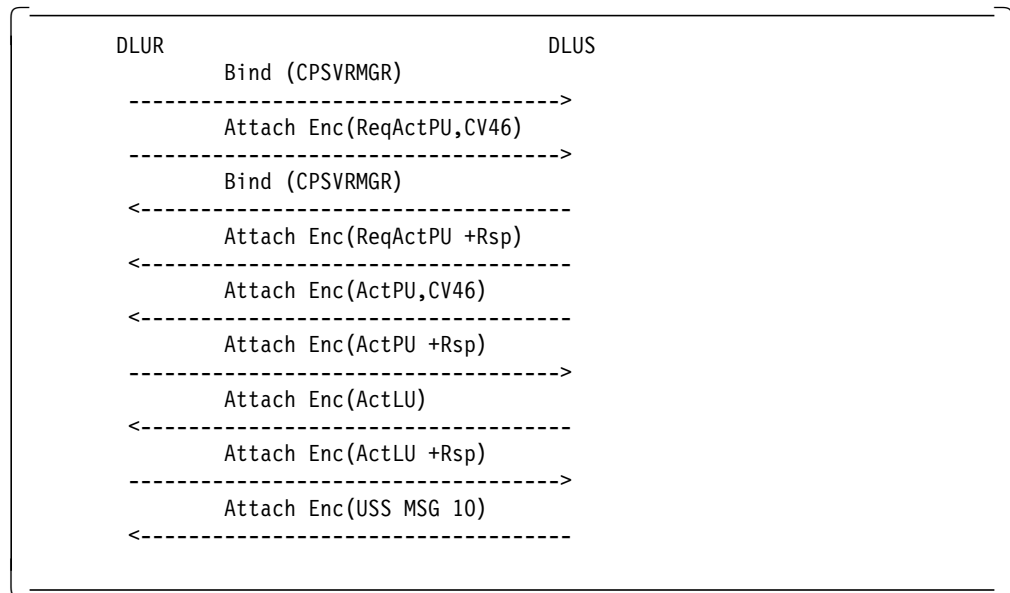


Figure 209. CPSVRMGR Session Flow

```

NCCF                                N E T V I E W    RAIAN DUCUT    06/30/94 13:41
* RAIAN      D NET,DLURS 1
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST350I  DISPLAY TYPE = DLURS
IST172I  NO DLUR NODES 2      SERVED
IST314I  END

-----

NCCF                                N E T V I E W    RAIAN DUCUT
C RAIAN      DISPLAY NET,ID=SW31743,SCOPE=ALL
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST075I  NAME = SW31743          , TYPE = SW SNA MAJ NODE
IST486I  STATUS= ACTIV          , DESIRED STATE= ACTIV
IST084I  NETWORK NODES:
IST089I  SW31743P TYPE = PHYSICAL UNIT      , CONCT
IST089I  S3174105 TYPE = LOGICAL UNIT       , CONCT
IST089I  S3174122 TYPE = LOGICAL UNIT       , CONCT
IST089I  S3174123 TYPE = LOGICAL UNIT       , CONCT
IST089I  S3174124 TYPE = LOGICAL UNIT       , CONCT
IST089I  S3174125 TYPE = LOGICAL UNIT       , CONCT
IST314I  END

```

Figure 210. DLUR VTAM Status During Activation

Figure 210 shows that when you issue a D NET, DLURS **1** command, NetView gives you a list of the active DLURs at that time. In our scenario, since the 3174 is not IMLed yet, message IST172I **2** is received indicating that no DLUR is ACTIVE. In the same way, displaying the switched major node for the DLUR definition in VTAM shows a status of CONCT for the PU and LU after a VARY ACT command. CONCT means that a VARY ACT command has completed for a switched PU/LU and a dial-in or dial-out request will be honored.

13.9 Verification from a 3174 Perspective

The 3270 Device Status Menu

```
_____ 3270 Device Status Menu _____

Option      Description
1           Display status summary
2,n,m      Display error counters for port n on HG m (n=0-31 m=26-27)
3,n,m      Display connectivity for port n on HG m (n=0-31 m=26-27)
4,n        Display LU status summary
           for Host ID n (n=1A-1H,2A-2D,3A-3D)
1 5,n,m    DLUR display connectivity for port n on HG m (n=0-31 m=26-27)

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> 5,3,26 1

PF: 3=Quit 12=Test Menu
```

Figure 211. The 3270 Port Connectivity Menu

The status of the DLUR connectivity is observed on panel option 5 from the 3270 Device Status Menu panel. The Port Connectivity display contains the same information as it would if DLUR support were not present.

1 The port we used was number 3 on hardware group 26 on the 3174-11R and number 1.

The DLUR Connectivity for Port 3, HG 26 on the 3174-11R

```
_____ DLUR Connectivity for PN 03, HG 26 _____

Adapter (HG) status:      Enabled
Port (PN) status:        Powered on
Device type:              Video display (MLT)

Current connectivity-

      LT  LU Name  DLUS CPNAME  PLU CPNAME  PLU-SLU Link ID
1 1  S3174105 2 USIBMRA.RAI 3 USIBMRA.RAI 4 1
    2  S3174122  USIBMRA.RAI  USIBMRA.RAI  1
    3  S3174123  USIBMRA.RAI  USIBMRA.RAI  1
    4  S3174124  USIBMRA.RAI  USIBMRA.RAI  1
    5  S3174125  USIBMRA.RAI  USIBMRA.RAI  1

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu
```

Figure 212. The 3174-11R DLUR Connectivity Display

1 There were 5 logical terminals assigned to this port, all five at this time were in session with host RAI.

2 The DLUS is displayed in the form of NETID.CPNAME.

3 The Primary LU and DLUS here are the same.

4 Each active link is assigned an ID. Since all LT are over a single link the ID is the same for all LTs.

3174-11R Host Status for DLUS

3270 Host Status Summary				
ID	Host Descriptor	HG	Attach	Connection Status
1A	DLUS host 1	11	SDLC	2 500-01 Up

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 213. The 3270 Host Status Panel

1 This shows us that host 1A is the DLUS host, and the link type is SDLC.

2 500-01 Up in the Connection Status field refers to the status code 500, which indicates normal operation.

3174-11R Session Status Panel

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	1 F86FE164A634E9B6	USIBMRA	RAI	ACTIVE	00	RAI	CP31743
2	2 EE4B78FF13D5E521	USIBMRA	CP31743	ACTIVE	00	CP31743	RAI

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 214. The Session Status Panel

1 Session status is only available at intermediate nodes. Here we see the session originating at the host and terminating in 3174-3.

2 This is the session originating in 3174-3 and terminating in the host.

3 Status 00 indicates that the session is operating normally.

The Adjacent Node Display for 3174-11R

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
1	USIBMRA	RALYAS4A	NN	OPEN	08	4	YES
2	USIBMRA	CP31743	NN	OPEN	08	2	YES

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 215. Adjacent Nodes to the 3174-11R

The adjacent nodes are the token-ring attached 3174-13R and the AS/400, RALYAS4A. A state of 08 here means the link is open.

The Local LU 6.2 Display, 3174-11R

Local LU 6.2 Session Status							
	PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
1	EE4B7AFF00000001	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	RALYAS4A
	F64B0D2BCB54603C	USIBMRA	RALYAS4A	ACTIVE	02	CPSVCMG	RALYAS4A
2	EE4B7AFF00000002	USIBMRA	CP31741	ACTIVE	02	CPSVRMGR	RAI
	F86FE164A83FF4B5	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI
3	FE4B7AFF00000005	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31743
	EE4B78FF17E81EA5	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CP31743

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 216. Sessions from the 3174-11R's Perspective

- 1 The CP-CP session between this 3174 and RALYAS4A
- 2 The DLUR/DLUS pipe from this 3174 to the host, RAI
- 3 The CP-CP session between 3174s

The PCID (together with a length qualifier and CPNAME) form the *fully qualified procedure correlation identifier* (FQPCID), is a network unique session identified assigned by session services which performs the following functions:

- It correlates requests and replies sent between APPN nodes.
- It identifies sessions during recovery or cleanup procedures.
- It identifies a session for problem determination.
- It identifies a session for accounting, auditing and performance monitoring purposes.

The sequence number, forming part of the PCID is incremented by 1 each time session services assigns an FQPCID, this can be seen in **1** and **2**. For a detailed explanation of the FQPCID generation process, please refer to *SNA APPN LEN Architecture Reference*, SC30-3422.

The Adjacent Node Display 3174-13R

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
-----	-----	-----	----	-----	-----	-----	-----
1 2			EN	CLOSED	01	0	NO
2 10	USIBMRA	CP31741	NN	OPEN	08	2	YES

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 217. The Session Status Panel

1 This was a previously active session, maintained in the cache until either all available LINKIDs have been used or the machine is powered off.

2 There is only one adjacent node, the 3174-11R.

The Local LU 6.2 Session Status Screen, 3174-13R

Local LU 6.2 Session Status							
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU	
-----	-----	-----	-----	--	-----	-----	
1 EE4B78FF17E81EA5	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CP31741	
EE4B7AFF00000005	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31741	
2 EE4B78FF17E81EA6	USIBMRA	CP31743	ACTIVE	02	CPSVRMGR	RAI	
F86FE164A83FF50B	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI	

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 218. The Session Status Panel

1 The CP-CP session between 3174s

2 The DLUR/DLUS pipe between this 3174 and the host, RAI

13.10 Verification from a Host Perspective

```

-----
* RAIAN      D NET,DLURS 1
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST350I      DISPLAY TYPE = DLURS
IST1352I      DLUR NAME 2          DLUS CONWINNER STATE  DLUS CONLOSER STATE
IST1353I      USIBMRA.CP31743  ACTIVE 3          ACTIVE 3
IST314I      END
-----
NCCF          N E T V I E W      RAIAN DUCUT      06/29/94 13:43
C RAIAN      DISPLAY NET,ID=SW31743,SCOPE=ALL 4
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST075I      NAME = SW31743          , TYPE = SW SNA MAJ NODE
IST486I      STATUS= ACTIV          , DESIRED STATE= ACTIV
IST084I      NETWORK NODES:
IST089I      SW31743P TYPE = PHYSICAL UNIT          , ACTIV
IST089I      S3174105 TYPE = LOGICAL UNIT          , ACTIV
IST089I      S3174122 TYPE = LOGICAL UNIT          , ACTIV
IST089I      S3174123 TYPE = LOGICAL UNIT          , ACTIV
IST089I      S3174124 TYPE = LOGICAL UNIT          , ACTIV
IST089I      S3174125 TYPE = LOGICAL UNIT          , ACTIV
IST314I      END
-----
NCCF          N E T V I E W      RAIAN DUCUT      06/29/94 13:4
C RAIAN      DISPLAY NET,ID=CP31743,SCOPE=ALL 5
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST075I      NAME = USIBMRA.CP31743 , TYPE = ADJACENT CP
IST486I      STATUS= ACT/S---Y, DESIRED STATE= ACTIV
IST977I      MDLTAB=***NA*** ASLTAB=***NA***
IST1333I      ADJLIST = ***NA***
IST861I      MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I      DLOGMOD=***NA*** USS LANGTAB=***NA***
IST597I      CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I      CDRSC MAJOR NODE = ISTCDRDY
IST479I      CDRM NAME = RAI          , VERIFY OWNER = NO
IST1184I      CPNAME = USIBMRA.CP31743 - NETSRVR = ***NA***
IST1044I      ALSLIST = ISTAPNPU
IST082I      DEVTYPE = INDEPENDENT LU / CDRSC
IST654I      I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I      ACTIVE SESSIONS = 0000000002, SESSION REQUESTS = 0000000000
IST206I      SESSIONS:
IST1081I      ADJACENT LINK STATION = RA9P05
IST634I      NAME      STATUS      SID          SEND RECV VR TP NETID
*IST635I      RAI 6      ACTIV/DL-S EE4B78FF00000003 000E 0000 0 0 USIBMRA
*IST635I      RAI 6      ACTIV/DL-P F86FE164A634EC37 0000 0012 0 0 USIBMRA
resources are treated as switched
IST089I      SW31743P TYPE = PHYSICAL UNIT          , ACTIV
IST924I
IST075I      NAME = USIBMRA.CP31743 , TYPE = DIRECTORY ENTRY

```

Figure 219. VTAM Status After a Successful DLUR/DLUS Connection

Activation of a CP-SVR pipe produces no new messages on the console, whether performed by VTAM or by the DLUR. In particular, there is no IST59XX VTAM message indicating successful DLUR/DLUS connection establishment.

After the pipe is established, a display of the DLURS 1, gives a list of DLURS 2 served by this DLUS RAI together with the status of the CPSVRMGRs. 3 Also, a display of the Switch Major Node 4 shows that resources are from RAI. Some interesting points are:

- Two CPSVRMGR sessions 6 denoted by 'ACTIV/DL'.
- Message IST355I tells that this CP is a served DLUR and which PU it serves.

NLDM LU to LU Session Display

NLDM.CON	SESSION CONFIGURATION DATA				PAGE	1
----- PRIMARY -----		----- SECONDARY -----				
NAME RAIAN005	SA 00000012	EL 0011		NAME S3174122	SA 00000018	EL 04E2
-----		-----				
DOMAIN RAIAN	PCID USIBMRA.RAI.F86FE164A83FF683				DOMAIN RAIAN	
+-----+ RAI ISTPUS18(0000)		CP/SSCP SUBAREA PU	---	---	+	+
+-----+		APPN TP 01			+	+
+-----+		SUBA TP 00			+	+
+-----+		VR 00			+	+
+-----+		ER 01			+	+
RAIAN005(0011)		LU	RER 01	LINK	J0000031	
+-----+					+	+
		APPNCOS #CONNECT			+	+
		LOGMODE M2SDLCQ		PU	RAMQASB (035C)	
		SADJ CP RALYAS4B			+	+
				ILU	S3174122(04E2)	
					+	+

Figure 220. NLDM Session LU-LU session with DLUR/DLUS

This figure shows the NLDM LU-LU session between S3174122 and RAIAN005. Both LUs reside in the domain RAIAN. VTAM sees only the adjacent link RAMQASB (which is the token-ring PU definition for RALYAS4B) as the PU for S3174122. It does not see the other intermediate node links through RALYAS4A and CP31741.

Chapter 14. DLUR with DLUS and PLU on Different Hosts

This scenario is used to demonstrate that the LU to LU session need not be with the same host as the SSCP to LU session. Sessions from dependent LUs can now be routed via any adjacent APPN node, rather than via the subarea node through which they have SSCP to LU sessions. With the DLUR function, the 3174 can be attached anywhere in the network rather than directly to the subarea node.

14.1 Configuration

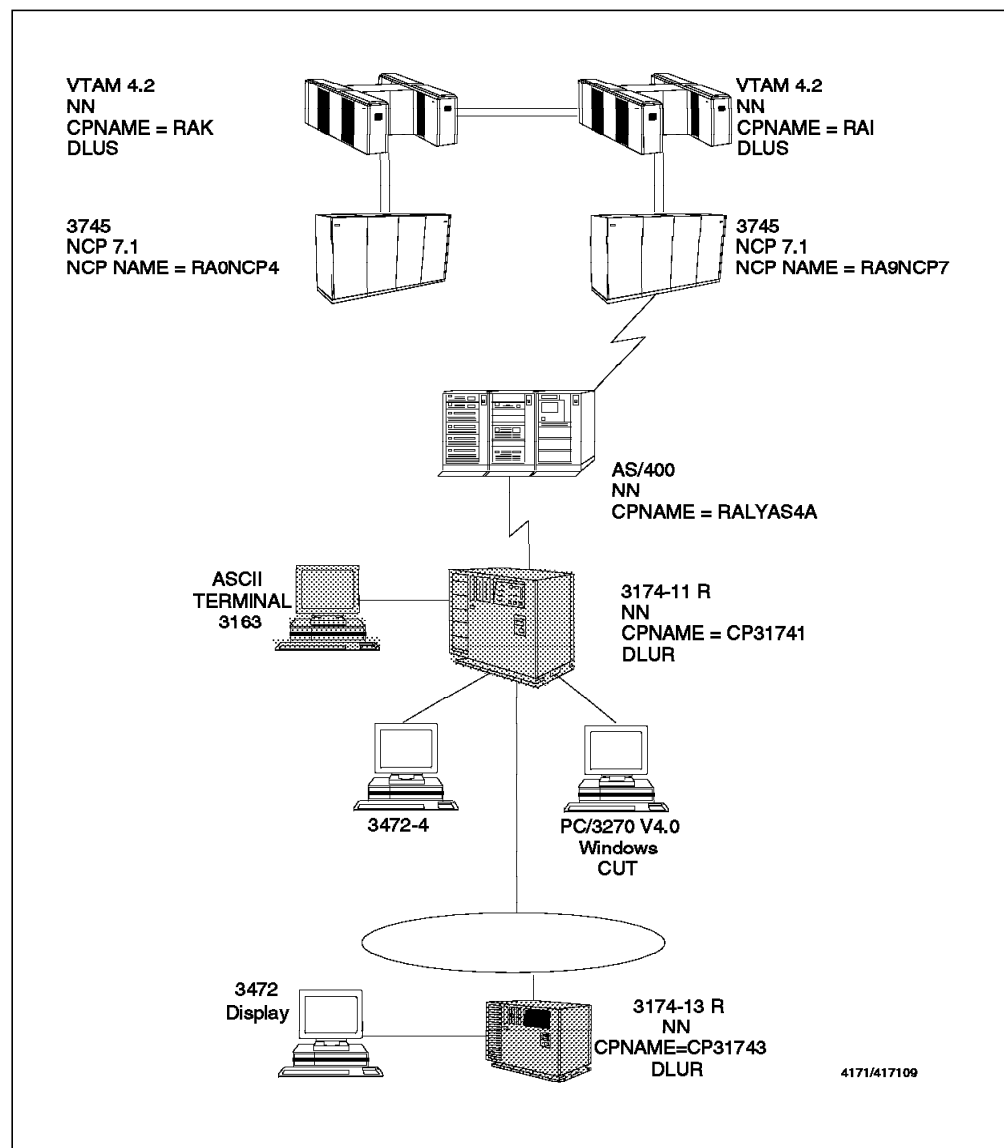


Figure 221. SLU to PLU in Host Not Containing DLUS

14.2 Definition Overview

The definitions for non-subarea entities, used in the scenario in Chapter 13, “DLUR-DLUS and PLU on the Same Host” on page 201, are used here. Another host, RAK, is added to RAI and connected via the multipath channel (MPC) function introduced in VTAM 4.1. With MPC, it is now possible to define many subchannels in a single full-duplex TG, increasing the available bandwidth between hosts and providing enhanced availability and recoverability. RAI serves as the DLUS for the 3174 and RAK owns the application.

The 3174 definitions were identical to those used in Chapter 13, “DLUR-DLUS and PLU on the Same Host” on page 201.

14.3 VTAM Definitions

Below is the definition used to show the MPC connection between RAI and RAK.

```
RAILCAA VBUILD TYPE=LOCAL
* APPN MPC LINK FROM RAI TO RAK *
RAIMPCAP PU TRLE=RAIMPCA,PUTYPE=2,XID=YES
```

Figure 222. VTAM SNA Major Node Connection of RAI to RAK

Being the intermediate node, we have sessions with both the APPN network node RAI and 3174-3.

14.4 Verification Using 3174 Online Tests

Adjacent Node Display for 3174-1

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
-----	-----	-----	---	-----	-----	-----	-----
1	USIBMRA	RAI	NN	OPEN	08	4	YES
2	USIBMRA	CP31743	NN	OPEN	08	2	YES

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 223. The Adjacent Node Display for 3174-1

As the intermediate node, we have sessions with both the APPN network node RAI and 3174-3.

Adjacent Node Display for 3174-3

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
2			EN	CLOSED	01	0	NO
10	USIBMRA	CP31741	NN	OPEN	08	2	YES

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 224. The Adjacent Node Display for 3174-3

Session Status for 3174-1

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	F86FE164A634F8A2	USIBMRA	RAI	ACTIVE	00	RAI	CP31743
2	EE4B78FF13D5D000	USIBMRA	CP31743	ACTIVE	00	CP31743	RAI
3	F86FE164A634F8BA	USIBMRA	RAI	ACTIVE	00	CICS18	SW317432
4	F8D3D1646519C632	USIBMRA	RAK	ACTIVE	00	RAKAN007	SW317433

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 225. The APPN Test Menu Panel

Session Status for 3174-3

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
No sessions currently exist							

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 226. Local LU 6.2 Sessions Display at 3174-3

Local LU 6.2 Session Status for 3174-1

Local LU 6.2 Session Status							
	PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
1	EE4B7AFF259AFDA0	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	RAI
	F86FE164A634F7F5	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI
2	EE4B7AFF259AFDA4	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31743
	EE4B78FF13D5CFFF	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CP31743
3	EE4B7AFF259AFDA2	USIBMRA	CP31741	ACTIVE	02	CPSVRMGR	RAI
	F86FE164A634F7FF	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 227. The APPN Test Menu Panel

- 1 The CP-CP session between this 3174 and RAI
- 2 The CP-CP session between 3174s
- 3 The DLUR/DLUS pipe from this 3174 to the host, RAI

Local LU 6.2 Session Status for 3174-3

Local LU 6.2 Session Status							
	PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
1	EE4B78FF13D5CFFF	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CP31741
	EE4B7AFF259AFDA4	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31741
2	EE4B78FF13D5D000	USIBMRA	CP31743	ACTIVE	02	CPSVRMGR	RAI
	F86FE164A634F8A2	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 228. The APPN Test Menu Panel

- 1 The CP-CP session between 3174s
- 2 The DLUR/DLUS pipe from this 3174 to the host, RAI

LT Connectivity for Port 3 of 3174-3

```

_____ Connectivity for PN 03, HG 26 _____

Adapter (HG) status:      Enabled
Port (PN) status:        Powered on
Device type:              Video display (MLT)

Current connectivity-

```

	LT	Bound	Host Addr	IDn	HG_PN	Host/Station Name
ACTIVE	1	No	005	1A1	11	3270 host
	2	Yes	022	1A2	11	3270 host
	3	Yes	023	1A3	11	3270 host
	4	Yes	024	1A4	11	3270 host
	5	Yes	025	1A5	11	3270 host

```

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  12=Test Menu

```

Figure 229. The APPN Test Menu Panel

DLUR Connectivity for Port 3 of 3174-3

```

_____ DLUR Connectivity for PN 03, HG 26 _____

Adapter (HG) status:      Enabled
Port (PN) status:        Powered on
Device type:              Video display (MLT)

Current connectivity-

```

	LT	LU Name	DLUS CPNAME	PLU CPNAME	PLU-SLU Link ID
1	1	S3174105	2 USIBMRA.RAI	3 USIBMRA.RAI	1
	2	S3174122	USIBMRA.RAI	USIBMRA.RAK	1
	3	S3174123	USIBMRA.RAI	USIBMRA.RAK	1
	4	S3174124	USIBMRA.RAI	USIBMRA.RAI	1
	5	S3174125	USIBMRA.RAI	USIBMRA.RAK	1

```

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  12=Test Menu

```

Figure 230. The 3174-11R DLUR Connectivity Display

- 1** There were five logical terminals assigned to this port.
- 2** The DLUS is displayed in the form of NETID.CPNAME.
- 3** The Primary LU and DLUS here are no longer the same, logical Terminals 2, 3 and 5 being in session with RAK.

3270 Host Status Summary for 3174-1

3270 Host Status Summary				
ID	Host Descriptor	HG	Attach	Connection Status
1A	DLUS host 1	11	SDLC	2 500-01 Up

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 231. The 3270 Host Status Panel

1 This tells us that the attachment to host 1A is SDLC and that the host is the DLUS.

2 500-01 Up in the Connection Status field refers to the status code 500, which indicates normal operation.

3174-11R Session Status Panel

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	1 F86FE164A634E9B6	USIBMRA	RAI	ACTIVE	00	RAI	CP31743
2	2 EE4B78FF13D5E521	USIBMRA	CP31743	ACTIVE	00	CP31743	RAI

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 232. The Session Status Panel

1 Session status is only available at intermediate nodes. Here we see the session originating at the host and terminating in 3174-3.

2 This is the session originating in 3174-3 and terminating in the host.

3 Status 00 here indicates that the session is operating normally.

Chapter 15. Border Node Support via the AS/400

In this scenario we have used Distributed Console Access Facility (DCAF) as the application typical of one which may need cross-network communications. The border node function is provided by an AS/400 network node with OS/400 V2.1, while the 3174 network node provides the border node coexistence support using Configuration Support-C5. There are no 3174 customization requirements to enable border node coexistence.

15.1 Configuration

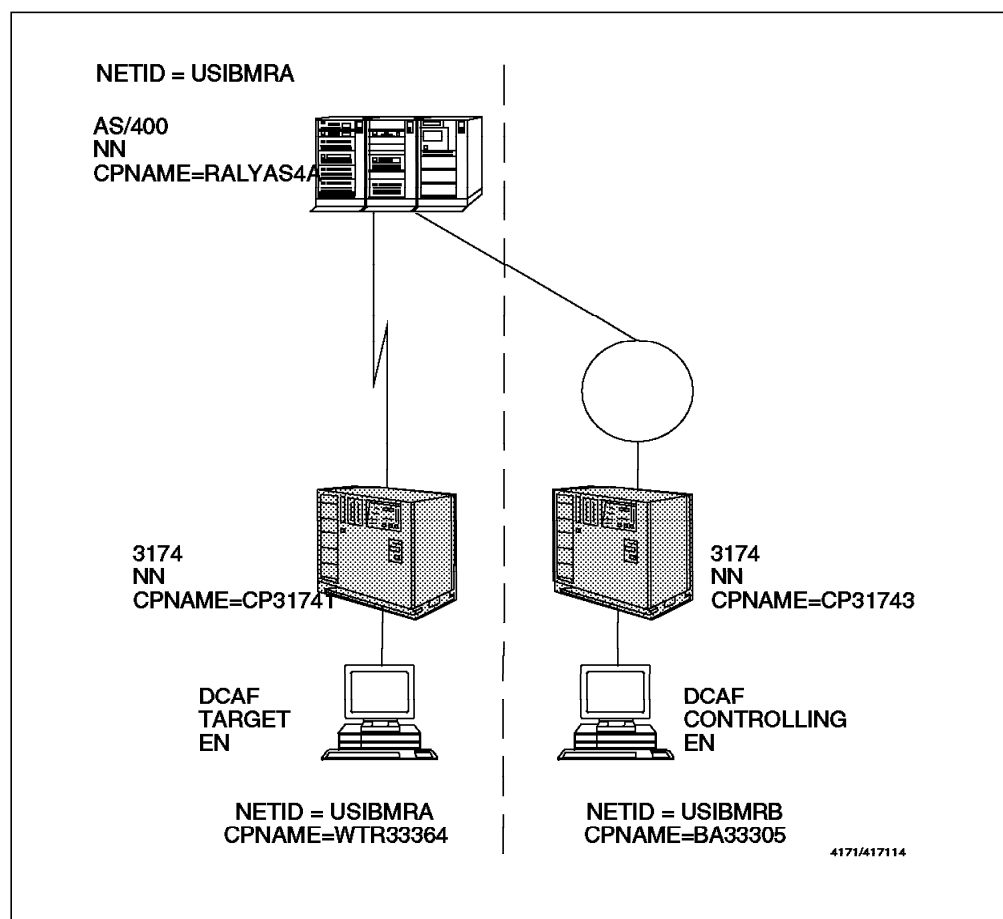


Figure 233. Border Node Support with DCAF

15.2 Definition Overview

Both 3174s are defined as network nodes with no gateway function. As the attached nodes are either network nodes (AS/400) or end nodes (PS/2s) there is no need to define them in the Network Resource panel.

The AS/400 is a network node with definitions on the token-ring and SDLC line for the 3174s.

The PS/2s are running OS/2 V2 with Communications Manager 2.1.1. DCAF is at V1R3. They are both defined as end nodes. The screens in use here are 8514s which are not supported by DCAF, hence they have to be defined as VGA screens.

Note:

During setup one particular problem was encountered worth special mention. Initially the PS/2s had only 4 Mbps adapters installed and BIND failures occurred during session setup. Because of the amount of RAM available on the adapter, the PS/2 negotiated an RU size of only 220 bytes. The smallest RU size supported by the 3174 is 256. Replacing the adapters with 16/4 Mbps versions and increasing the buffer size from 8Kb to 32Kb fixed the problem.

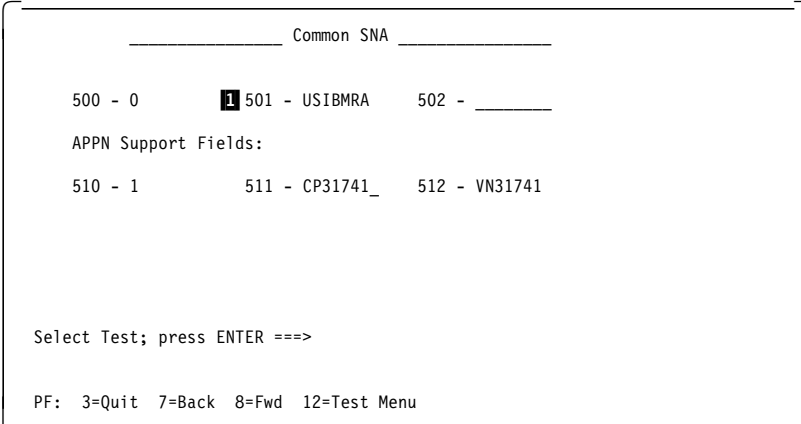
A trace of the exchanges between the 3174-13R and the AS/400 border node can be found in F.3, "AS/400 and 3174 Border Node Exchange Traces" on page 489.

15.3 3174 Customization

The basic customization panels are not shown here as they are similar to those presented in other scenarios in this document that involve token-ring or SDLC attachment to an AS/400. The major change in customization is that the 3174s are in different networks.

15.3.1 Enabling 3174 APPN

Enabling APPN for the 3174-11R on Network USIBMRA



```
Common SNA

500 - 0      1 501 - USIBMRA      502 - 
APPN Support Fields:
510 - 1      511 - CP31741_      512 - VN31741

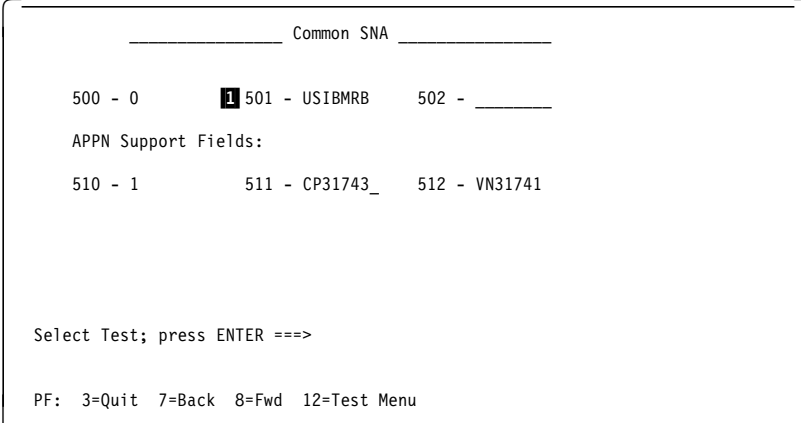
Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 234. The Common SNA Panel 3174-11R

1 This 3174 is in the same network as the AS/400, USIBMRA.

Enabling APPN for the 3174-13R on Network USIBMRB



```
Common SNA

500 - 0      1 501 - USIBMRB      502 - 
APPN Support Fields:
510 - 1      511 - CP31743_      512 - VN31741

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 235. The Common SNA Panel 3174-13R Showing Different NETIDs

1 This 3174 is in network USIBMRB. The rest of the network is not shown here.

15.3.2 Defining the 3174 Adjacent Nodes

The adjacent nodes to both 3174s consist of the AS/400 network node and PS/2s defined end nodes, no nodes had to be defined on the Network Resources panel.

15.4 AS/400 Definitions

Line and Controller description for the 3174-11R

Display Line Description	
Line description	LIN3174C1
Option	*BASIC
Category of line	*SDLC
Resource names	LIN061
Online at IPL	*YES
Data link role	*NEG
Physical interface	*RS232V24
Connection type	*NONSWTPP
Switched network backup	*NO
Exchange identifier	05615078
NRZI data encoding	*YES
Maximum controllers	1
Clocking	*MODEM
Line speed	9600
Modem type supported	*NORMAL
Modem data rate select	*FULL
Line description	LIN3174C1
Option	*BASIC
Category of line	*SDLC
Autoanswer type	*DTR
Maximum frame size	521
Error threshold level	*OFF
Duplex	*HALF
Modulus	8
Text	*BLANK
Display Controller Description	
Controller description	CTL3174C1
Option	*BASIC
Category of controller	*APPC
Link type	*SDLC
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
Attached nonswitched line	LIN3174C1
Character code	*EBCDIC
Maximum frame size	521
Remote network identifier	USIBMRA
Remote control point	CP31741
Data link role	*NEG
Station address	C4
Text	*BLANK

Figure 236. AS/400 Line and Controller Description of CP31741

Figure 236 shows the SDLC line and controller description for the AS/400 to connect to the 3174. The 3174, as a network node belonging to the same network as the AS/400, has the same USIBMRA NETID.

Line and Controller description for the 3174-13R

Line description	L41TR	
Option	*BASIC	
Category of line	*TRLAN	
Resource name	LIN041	
Online at IPL	*YES	
Vary on wait	*NOWAIT	
Network controller	L41TRNET00	
Maximum controllers	256	
Line speed	4M	
Maximum frame size	1994	
TRLAN manager logging level	*OFF	
Current logging level	*OFF	
TRLAN manager mode	*OBSERVING	
Log configuration changes	*LOG	
Token-Ring inform of beacon	*YES	
Local adapter address	400010020001	
Exchange identifier	05615078	
Error threshold level	*OFF	
Text	4M Token-ring line LIN041	
Display Controller Description		
Controller description	CTL3174C3	RA
Option	*BASIC	
Category of controller	*APPC	
Link type	*LAN	
Online at IPL	*YES	
Active switched line	L41TR	
Character code	*EBCDIC	
Maximum frame size	16393	
Remote network identifier	USIBMRB	
Remote control point	CP31743	
Initial connection	*DIAL	
Dial initiation	*LINKTYPE	
Switched disconnect	*YES	
Data link role	*NEG	
LAN remote adapter address	400031740003	
LAN DSAP	04	
LAN SSAP	04	
Text	*BLANK	

Figure 237. AS/400 Line and Controller Description of CP31743

Figure 237 contains the Line and Controller definition for the token-ring 3174. The NETID parameter here matches the one used by CP31743.

15.5 PS/2 Customization

Distributed Console Access Facility (DCAF) is written to utilize the APPN/APPC subsystem of CM/2. We will need to configure CM/2 and Distributed Console Access Facility (DCAF) for the controlling and target workstations.

15.5.1 CM/2 Configuration

Shown here are the Network Definition Files (.NDF file extension) for the controlling and target workstations.

Network Definition File (.NDF) for the Controlling Workstation

```
DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRB.BA33305 ) 1
                  CP_ALIAS(BA33305 )
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN) 2
                  NODE_ID(X'05D00001')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(LINK0001)
                   ADJACENT_NODE_TYPE(NN) 3
                   PREFERRED_NN_SERVER(YES)
                   DLC_NAME(IBMTRNET)
                   ADAPTER_NUMBER(0)
                   DESTINATION_ADDRESS(X'40003174000304') 4
                   ETHERNET_FORMAT(NO)
                   CP_CP_SESSION_SUPPORT(YES)
                   SOLICIT_SSCP_SESSION(NO)
                   ACTIVATE_AT_STARTUP(YES)
                   USE_PUNAME_AS_CPNAME(NO)
                   LIMITED_RESOURCE(NO)
                   LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                   MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                   EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                   COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                   COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                   SECURITY(USE_ADAPTER_DEFINITION)
                   PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_LOCAL_LU  LU_NAME(GATEWAY )
                 LU_ALIAS(GATEWAY )
                 NAU_ADDRESS(INDEPENDENT_LU);

DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(USIBMRA.WTR33364 ) 5
                  PARTNER_LU_ALIAS(WTR33364)
                  PARTNER_LU_UNINTERPRETED_NAME(WTR33364)
                  MAX_MC_LL_SEND_SIZE(32767)
                  CONV_SECURITY_VERIFICATION(YES)

                  PARALLEL_SESSION_SUPPORT(YES);
```

Figure 238 (Part 1 of 2). Controlling DCAF

```

DEFINE_MODE MODE_NAME(DCAFMODE) 6
    COS_NAME(#CONNECT)
    DEFAULT_RU_SIZE(NO)
    MAX_RU_SIZE_UPPER_BOUND(1024)
    RECEIVE_PACING_WINDOW(4)
    MAX_NEGOTIABLE_SESSION_LIMIT(32767)
    PLU_MODE_SESSION_LIMIT(16)
    MIN_CONWINNERS_SOURCE(0)
    PACING_TYPE(FIXED)
    COMPRESSION_NEED(PROHIBITED)
    PLU_SLU_COMPRESSION(NONE)
    SLU_PLU_COMPRESSION(NONE);

DEFINE_TP TP_NAME(IBM.DCAF.CONTROLLING.TRANSACTION.PROGRAM) 7
    PIP_ALLOWED(NO)
    FILESPEC(D:\DCAF12\EQNCTRAM.EXE)
    CONVERSATION_TYPE(BASIC)
    CONV_SECURITY_RQD(NO)
    SYNC_LEVEL(NONE)
    TP_OPERATION(NONQUEUED_AM_STARTED)
    PROGRAM_TYPE(BACKGROUND)
    RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

DEFINE_TP TP_NAME(IBM.DCAF.GATEWAY.TRANSACTION.PROGRAM)
    PIP_ALLOWED(NO)
    FILESPEC(D:\DCAF12\EQNGTWAM.EXE)
    CONVERSATION_TYPE(ANY_TYPE)
    CONV_SECURITY_RQD(NO)
    SYNC_LEVEL(EITHER)
    TP_OPERATION(NONQUEUED_AM_STARTED)
    PROGRAM_TYPE(BACKGROUND)
    RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

START_ATTACH_MANAGER;

```

Figure 238 (Part 2 of 2). Controlling DCAF

- 1 The NETID and CPNAME of this PS/2
- 2 Defined as an end node
- 3 Connection to an adjacent network node (3174-3)
- 4 The token-ring address of 3174-3
- 5 The NETID and CPNAME of the target workstation
- 6 A new mode we used to get DCAF working
- 7 The transaction program for the controlling workstation

Network Definition File (.NDF) for the Target Workstation

```

DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.WTR33364 ) 1
                  DESCRIPTION(Created on 06-24-94 at 08:45a)
                  CP_ALIAS(WTR33364)
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN) 2
                  NODE_ID(X'05D00000')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_CONNECTION_NETWORK  FQ_CN_NAME(USIBMRA.CP31741 )
                           ADAPTER_INFO(  DLC_NAME(IBMTRNET)
                                           ADAPTER_NUMBER(0));

DEFINE_LOGICAL_LINK  LINK_NAME(LINK0001)
                     ADJACENT_NODE_TYPE(NN) 3
                     PREFERRED_NN_SERVER(YES)
                     DLC_NAME(IBMTRNET)
                     ADAPTER_NUMBER(0)
                     DESTINATION_ADDRESS(X'40003174000104') 4
                     ETHERNET_FORMAT(NO)
                     CP_CP_SESSION_SUPPORT(YES)
                     SOLICIT_SSCP_SESSION(NO)
                     ACTIVATE_AT_STARTUP(YES)
                     USE_PUNAME_AS_CPNAME(NO)
                     LIMITED_RESOURCE(NO)
                     LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                     MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                     EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                     COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                     COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                     SECURITY(USE_ADAPTER_DEFINITION)
                     PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(USIBMRB.BA33305 ) 5
                   PARTNER_LU_ALIAS(BA33305)
                   PARTNER_LU_UNINTERPRETED_NAME(BA33305 )
                   MAX_MC_LL_SEND_SIZE(32767)
                   CONV_SECURITY_VERIFICATION(NO)
                   PARALLEL_SESSION_SUPPORT(YES);

DEFINE_MODE  MODE_NAME(DCAFMODE) 6
             COS_NAME(#CONNECT)
             DEFAULT_RU_SIZE(NO)
             MAX_RU_SIZE_UPPER_BOUND(1024)
             RECEIVE_PACING_WINDOW(4)
             MAX_NEGOTIABLE_SESSION_LIMIT(32767)
             PLU_MODE_SESSION_LIMIT(16)
             MIN_CONWINNERS_SOURCE(0)
             COMPRESSION_NEED(PROHIBITED)
             PLU_SLU_COMPRESSION(NONE)
             SLU_PLU_COMPRESSION(NONE);

DEFINE_TP  TP_NAME(IBM.DCAF.TARGET.TRANSACTION.PROGRAM) 7
           DESCRIPTION(Created on 06-23-94 at 12:24p)
           PIP_ALLOWED(NO)
           FILESPEC(D:\DCAF12\EQNTGAUT.EXE)
           PARM_STRING(LU62)
           CONVERSATION_TYPE(BASIC)
           CONV_SECURITY_RQD(NO)
           SYNC_LEVEL(EITHER)
           TP_OPERATION(NONQUEUED_AM_STARTED)
           PROGRAM_TYPE(PRESENTATION_MANAGER)
           RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

START_ATTACH_MANAGER;

```

Figure 239. Target DCAF

- 1** The NETID and CPNAME of this PS/2
- 2** Defined as an end node
- 3** Connection to an adjacent network node (3174-1)
- 4** The token-ring address of 3174-1
- 5** The NETID and CPNAME of the controlling workstation
- 6** A new mode we used to get DCAF working, detailed in Figure 240
- 7** The transaction program for the target workstation.

15.5.2 DCAF Setup

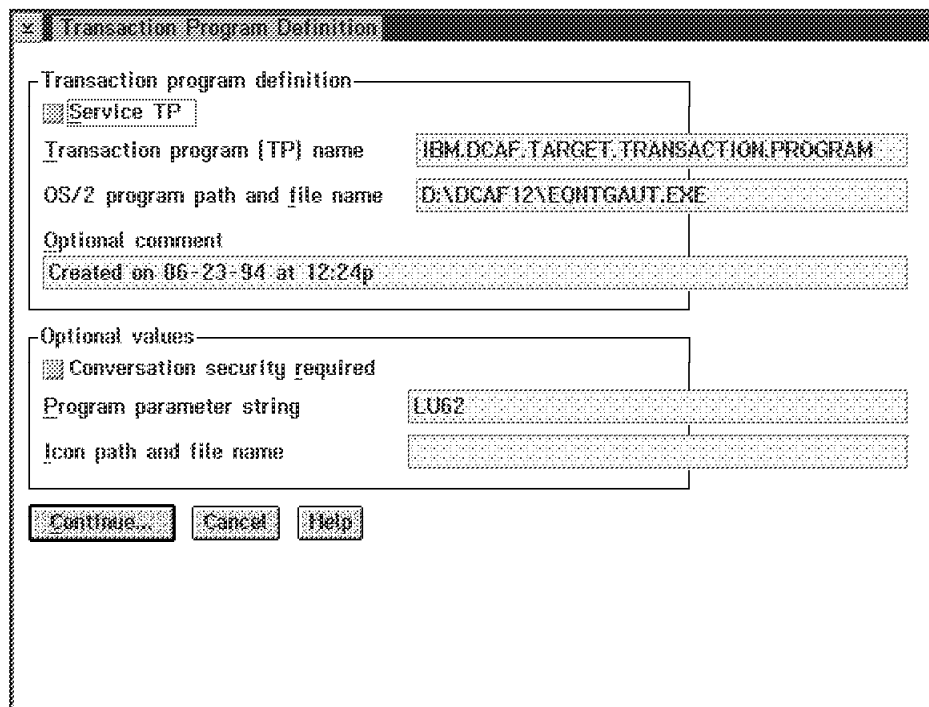
Mode Definition

The screenshot shows a 'Mode Definition' dialog box with the following fields and options:

- Mode name:** DCAFMODE
- Class of service:** BCONNECT
- Mode session limit:** 16 (range 0 - 32767)
- Minimum contention winners:** 0 (range 0 - 32767)
- Receive pacing window:** 4 (range 0 - 63)
- Compression:**
 - Compression need:** PROHIBITED
 - PLU->SLU compression level:** NONE
 - SLU->PLU compression level:** NONE
- RU size:**
 - ☐ Default RU size
 - ☒ Maximum RU size: 1024 (range 256 - 16384)
- Optional comment:** (empty text field)
- Buttons:** OK, Cancel, Help

Figure 240. DCAFMODE on the Target Workstation

Transaction Program Definition



The dialog box titled "Transaction Program Definition" contains two main sections. The first section, "Transaction program definition", includes a "Service TP" checkbox, a text field for "Transaction program (TP) name" with the value "IBM.DCAF.TARGET.TRANSACTION.PROGRAM", a text field for "OS/2 program path and file name" with the value "D:\DCAF12\EONTGAUT.EXE", and an "Optional comment" field with the text "Created on 86-23-94 at 12:24p". The second section, "Optional values", includes a "Conversation security required" checkbox, a text field for "Program parameter string" with the value "LU62", and an empty text field for "Icon path and file name". At the bottom are "Continue", "Cancel", and "Help" buttons.

Transaction program definition

☒ Service TP

Transaction program (TP) name IBM.DCAF.TARGET.TRANSACTION.PROGRAM

OS/2 program path and file name D:\DCAF12\EONTGAUT.EXE

Optional comment

Created on 86-23-94 at 12:24p

Optional values

☒ Conversation security required

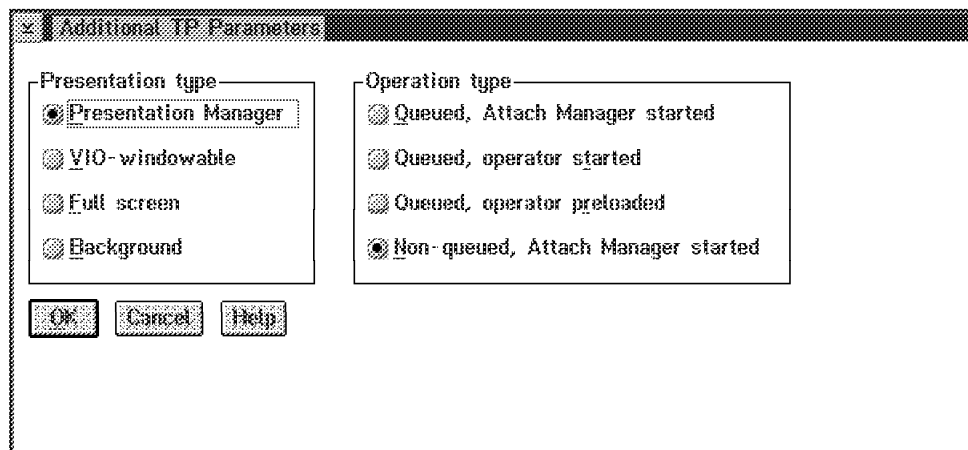
Program parameter string LU62

Icon path and file name

Continue Cancel Help

Figure 241. DCAF Transaction Program on the Target Workstation

Additional TP Parameters



The dialog box titled "Additional TP Parameters" contains two sections. The "Presentation type" section has four radio buttons: "Presentation Manager" (selected), "VIO-windowable", "Full screen", and "Background". The "Operation type" section has five radio buttons: "Queued, Attach Manager started", "Queued, operator started", "Queued, operator preloaded", and "Non-queued, Attach Manager started" (selected). At the bottom are "OK", "Cancel", and "Help" buttons.

Additional TP Parameters

Presentation type

☒ Presentation Manager

☐ VIO-windowable

☐ Full screen

☐ Background

Operation type

☐ Queued, Attach Manager started

☐ Queued, operator started

☐ Queued, operator preloaded

☒ Non-queued, Attach Manager started

OK Cancel Help

Figure 242. DCAF Additional TP Parameters on the Target Workstation

15.6 Verification at the 3174s

Three test panels, on the 3174s, provide us with useful relevant information in this situation: the Adjacent Nodes, Session Status and Local LU6.2 Session Status panels. These are all available from the APPN Test Menu panel.

15.6.1 Verification from the 3174-11R Perspective

3174-11R Adjacent Nodes

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
-----	-----	-----	----	-----	-----	-----	-----
1 1	USIBMRA	RALYAS4A	NN	OPEN	2 08	3 7	YES
2	USIBMRA	WTR33364	EN	OPEN	08	3	YES

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 243. The 3174-11R Adjacent Nodes Display

From the 3174-11R with the same NETID as the target DCAF and AS/400, we see that the PS/2 appears as an EN and the AS/400 as a NN, as we would expect. Both links are open and a number of sessions established.

1 The LINKID is an identification number used to select a node for the Link Status Test.

2 A State of 08 indicates that the link is open.

3 These sessions are detailed in the Local LU6.2 Session Status display.

For a description of the other possible states see the *3174 Establishment Controller Maintenance Manual*, SY27-2572.

3174-11R Session Status

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	F0FB39DB634D9727	USIBMRA	WTR33364	ACTIVE	00	WTR33364	BA33305
2	D1FB0A1363342050	USIBMRB	BA33305	ACTIVE	00	BA33305	WTR33364
3	F0FB39DB644D9727	USIBMRA	WTR33364	ACTIVE	00	WTR33364	BA33305

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4730-Enter the NUM to run the Pending Session Route Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 244. 3174-11R Session Status

1 The Num identifier is used only for the Pending Session Route Test available from this panel. The Status and ST indicator tells us that the sessions are active and operating normally. The OLU and DLU give us the origin and destination LU for the session, in this case the two PS/2 end nodes.

3174-11R Local LU 6.2 Session Status Display

Local LU 6.2 Session Status							
	PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
1	EE4B7AFF21F317DC	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	RALYAS4A
	F64B0D2BCB476875	USIBMRA	RALYAS4A	ACTIVE	02	CPSVCMG	RALYAS4A
	EE4B7AFF21F317DD	USIBMRA	CP31741	ACTIVE	02	CPSVRMGR	RAI
	F86FE164A6AD5D5A	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI
	F64B0D2ECB476BE9	USIBMRA	RALYAS4B	ACTIVE	02	SNASVCMG	RALYAS4B
	EE4B7AFF21F317E0	USIBMRA	CP31741	ACTIVE	02	SNASVCMG	RALYAS4B
2	EE4B7AFF21F317E1	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	WTR33364
	F0FB39DB624D9727	USIBMRA	WTR33364	ACTIVE	02	CPSVCMG	WTR33364

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 245. 3174-11R LU 6.2 Session Status

Note that this was part of a larger APPN network and DLUR was still active on this 3174. Of particular interest are the following:

- 1** The CP-CP session between the 3174-11R (CP31741) and AS/400 (RALYAS4A).
- 2** The CP-CP session between the 3174-11R (CP31741) and target DCAF PS/2 (WTR33364).
- 3** A status of 02 indicates the session is operating normally.

15.6.2 Verification from the 3174-13R Perspective

3174-13R Adjacent Nodes Display

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
10	USIBMRA	RALYAS4A	2 EN	OPEN	08	5	YES
11	USIBMRB	1 BA33305	EN	OPEN	08	3	YES

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 246. The 3174-13R Adjacent Nodes Display

1 The controlling DCAF and this 3174-13R are both in NETID USIBMRA.

2 Note here the appearance of the AS/400 as an end node. The AS/400 acts as a network node in its own network, but as NNs cannot currently connect to each other if in different networks it provides an end node image to the 3174-13R NN.

3174-13R Local LU 6.2 Session Status

Local LU 6.2 Session Status							
	PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
1	EE4B7CFF455A7188	USIBMRB	CP31743	ACTIVE	02	CPSVCMG	RALYAS4A
	F64B0D2BCB476887	USIBMRA	RALYAS4A	ACTIVE	02	CPSVCMG	RALYAS4A
	EE4B7CFF455A7189	USIBMRB	CP31743	ACTIVE	02	CPSVRMGR	RAI
	F86FE164A6AD5D5D	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI
	EE4B7CFF455A701E	USIBMRB	CP31743	ACTIVE	02	CPSVCMG	BA33305
2	D1FB0A1343342050	USIBMRB	BA33305	ACTIVE	02	CPSVCMG	BA33305

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 247. 3174-13R Local LU 6.2 Session Status Display

Note again that the 3174-13R is part of a larger APPN network and DLUR is still active on this 3174.

We can see at **1** and **2** that CP31743 (3174-13R) and BA33305 (Controlling DCAF) are in NETID USIBMRB.

Chapter 16. APPN over Frame Relay

Utilizing the current Communications Adapter (CA) and Configuration Support-C5, the 3174 supports APPN over frame relay links. The links can be any combination of unique data link identifiers (DLCIs) and service access points (SAPs). 3174 APPN support for frame relay can have up to 254 concurrent links. The APPN frame relay support is compatible with the Frame Relay Boundary (BNN) function in NCP V7R1 and the frame relay frame handler support in NCP V6R2. The 3174 NN can communicate directly with another 3174 NN (DTE to DTE) without a frame relay network, or can use standard Frame Relay DTE communication through a private or public frame relay network to remote APPN and LEN nodes. The frame relay environment is covered more extensively in *3174 Network Server in Frame Relay and Multiprotocol Networks*, GG24-4376.

16.1 Configuration

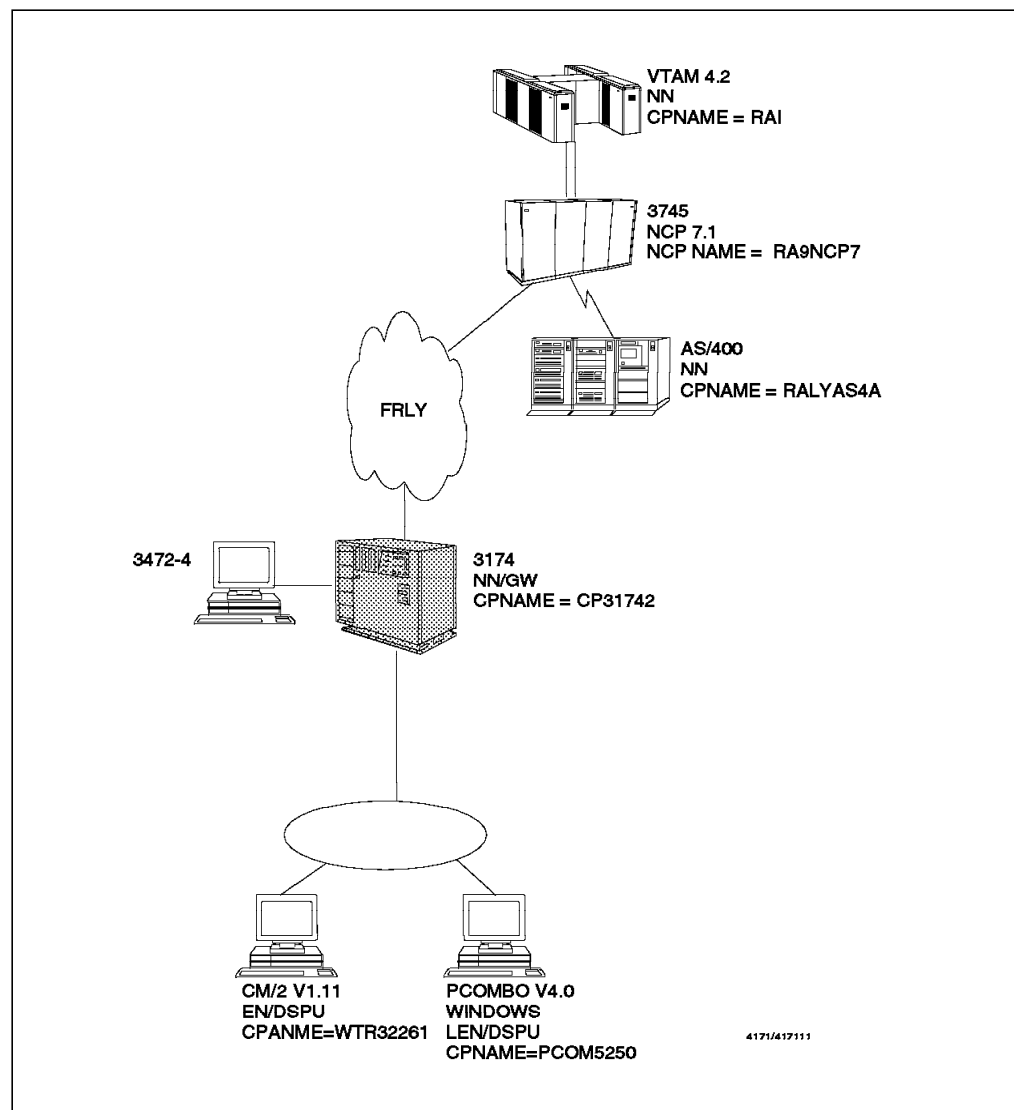


Figure 248. APPN across Frame Relay

16.2 Definition Overview

The environment we used is similar to that with the APPN over X.25, but here we are running the link at 256Kbps. In order to use a frame relay connection we need to define, as a minimum, the DLCI and SAP of the host. Another host option has been introduced on the Host Link panel which, if selected, initiates the sequence of panels required for the definition.

The PS/2 used in this scenario has the following software installed:

- DOS 6.1
- Microsoft Windows for Workgroups 3.1
- Personal Communications AS/400 and 3270 Version 4.0 for Windows
- IBM LAN Support Program Version 1.33

Personal Communications AS/400 and 3270 Version 4.0 for Windows is used to provide 3270 emulation to a S/390 host and 5250 emulation to a AS/400 from a single workstation.

An APPC LU 6.2 session is used for the communication with the AS/400 while a PU 2.0/LU type 2 session is used for communication to the S/390 host.

Note that the frame relay support is limited to the primary Communication Adapter (CA) only. Frame relay is not supported via communication through the Concurrent Communications Adapter (CCA).

16.3 3174 Customization

16.3.1 Defining 3174 Attachments

3174 Model/Attachment Panel

The screenshot shows the '3174 Model / Attach' panel with the following fields and options:

- Online Test Password: 098 -
- Product Assistance Data: 099 -
- 3174 Model: 100 - 11R
- Host Attachment: **1** 101 - 9
 - (1-BSC, 2-SDLC, 3-X.25, 4-Non-SNA Channel, 5-SNA Channel, 6-SDLC, X.21 Switched, 7-Token-Ring, 8-Ethernet, 9-Frame Relay, M-Multi-host)
- LAN adapter type: **2** 102 - 1
 - (0-none, 1-Token-Ring, 2-Ethernet)
- NSO selection: 103 - 0000000000000000
- Select Test; press ENTER ==>
- PF: 3=Quit 8=Fwd 12=Test Menu

Figure 249. Defining the 3174 Frame Relay and Token-Ring Attachments

1 The link to the host is frame relay.

2 The LAN adapter type is token-ring.

Token-Ring Description

```
_____ Token-Ring Description _____

Token-Ring Address  080 - 4000 3174 0002

Token-Ring Speed    082 - 0  (0- 4Mbps
                             1-16Mbps
                             2-16Mbps with early Token Release)

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu
```

Figure 250. Defining the Token-Ring

Frame Relay Host Link Definitions

```
_____ Frame Relay _____

1 090- 0500 04  108 - 3174002  110 - 0 0001  116 - 1  __
121 - 01      123 - 0          125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1  137 - 0 0 0 0  138 - 0
141 - A       2 150 - 1        165 - 1        166 - A        168 - 0
172 - 0       173 - 00000000 175 -          179 - 0 0 0
213 - 1       3 215 - 31742   220 - 0
4 250- 03     5 251 - 030     6 252 - 07     7 253 - 002
260 - 2       261 - 2

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu
```

Figure 251. Defining the Frame Relay Connection

1 The four digit decimal DLCI number and SAP. The DLCI can have a value from 0016 to 1007; the SAP must be a multiple of 4 ranging from X'04' to X'EC'. This DLCI will be a shared T2.0/T2.1 link. This is because the 3174 is defined as a LAN gateway **2**, as well as an APPN NN.

3 The 3174 has DLUR to a DLUS defined, so the PUID specified in Question 251 must match the IDNUM defined on the PU in the VTAM switched major node for this controller.

The following parameters are defaulted and relate to the frame relay link:

- 4** Frame Relay LLC Poll/Response Timer. Default is 3 seconds.
- 5** Frame Relay LLC Idle Timer. Default is 30 seconds.
- 6** Frame Relay LLC Retry Count. Default is 7 times.
- 7** Frame Relay LLC Transmit Window Size. Default is 2 transmits.

16.3.2 Enabling 3174 APPN

Common SNA

```

_____ Common SNA _____

500 - 0          501 - USIBMRA      502 - _____

APPN Support Fields:

510 - 1          511 - CP31742      512 - CP3174VN

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 252. Common SNA Parameters to Enable 3174 APPN

16.3.3 Defining the Gateway Links

Defining the Number of Links to DSPUs

```

_____ Common Network _____

900 - 4000 3174 0002 04    905 - 1          908 - 31742

925 - 002 1

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 253. Defining the Number of DSPUs

This panel is common to all networks, Question 925 **1** is used to specify the number links to DSPUs and will determine how many indexes will be available on the Frame Relay Index Assignment panel.

16.3.4 Frame Relay Index Assignment

The Frame Relay Index Assignment panel allows you to map the DLCI/SAP pair to a LAN address/SAP on the LAN Address Assignment panel in Question 940.

In this scenario we are using a single DLCI with multiple SAPs to service the DSPUs. This can save you money when using public networks because some services charge extra for each DLCI.

Frame Relay Index Assignment

1 S	2 DLCI	3 SAP		S	DLCI	SAP
00	0500	04				
01	0500	08		02	0500	0C

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 254. DSPU to Frame Relay Link Correlation

1 S is an index number based on the number of LAN attached DSPUs specified in Question 925. This is transferred to the S column on the LAN Address Assignment panel shown in Figure 255 on page 246.

2 DLCIs can have a decimal value between 0016 and 1007. Every DLCI and SAP combination must be unique for all DSPUs.

3 The SAP can have a decimal value in increments of 4 (decimal) from X'04' to X'EC'.

16.3.5 Defining the Gateway LAN Attachment

LAN Address Assignment

```
_____ 940: LAN Address Assignment _____

S      LAN Address  SAP  T      S      LAN Address  SAP  T
1 00   4000 3174 0002  04      02   4000 0003 2273  04  1
01   4000 3174 9992  08 2 1 3

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 255. Defining the LAN Attached DSPUs

1 The index number transferred from the Frame Relay Index Assignment panel Figure 254 on page 245 based on the number of LAN DSPUs specified in Question 925 on Figure 253 on page 244.

2 The PS/2 has both 5250 and 3270 host links and requires two SAPs. In the APPN (T2.1) definitions a SAP of 04 is used. SAP X'08' is specified as the local SAP at the PS/2 for 3270 (T2.0) host connectivity.

3 The type of DSPU and default frame size:

0=Workstation

1=3174 Establishment Controller

2=8KB RU device (not applicable for Ethernet networks)

In our case the DSPU is a PS/2 running Personal Communications AS/400 and 3270 Version 4.0 for Windows emulating a 3270 PU T2.0 (hence our response of 1). This will give us a default frame size of 265 which we will override in Question 941.

LAN Transmission Definition

```
_____ 941: LAN Transmission Definition _____

S      LAN Address  SAP  F  W      S      LAN Address  SAP  F  W
00   4000 3174 0002  04      02   4000 0003 2273  04  3  2
01   4000 3174 9992  08 1 2 2

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 256. LAN Transmission Characteristics

1 This is the transmit I-frame size which includes nine bytes for SNA headers. Here we used 1033 bytes (the range being 265 to 8201 bytes). 1033 will accommodate an RU of 1024.

2 Maximum-Out (transmit window size). The default shown here is 2. The range is 1 to 7.

16.3.6 Defining the Frame Relay Circuit

Frame Relay Description

Frame Relay Description

300 -	1	Enable Frame Relay (0-No, 1-Yes)
313 -	0 1	NRZ (0-NRZ, 1-NRZI)
552 -	020 2	Maximum Number of DLCIs (001-254)
554 -	256000 3	Committed Information Rate (002048-256000)
558 -	0	Congestion Control (0-No support, 1-Support)
560 -	0	DE Bit Support (0-No support, 1-Support)
562 -	3 4	LMI Type (1-None, 2-LMI Rev-1, 3-Annex-D, 5-CCITT)
563 -	05 5	LMI Transmit Polling Interval (1-29)
566 -	0000 6	Additional Receive Buffer Space (0000-1024)
569 -	N 7	Define DLCIs (N-No, Y-Yes)

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 257. Frame Relay Parameters

1 Most frame relay switches use NRZ (NRZI=No) as the default for most FRTE physical lines.

2 The number chosen must be large enough to accommodate the DLCIs specified for the accumulative host, DSPU and APPN links.

3 The CA can now handle up to 256 Kbps (our chosen response).

4 The default of 3, ANSI Annex D (DLCI 0), has been taken. The response to this question determines which LMI type is supported by the frame relay network.

5 Our network subscriptions dictated a polling interval of 5 seconds. The customization default is 10 seconds.

6 Here we can allocate additional storage to receive frames to reduce the possibility of fragmentation. You can respond to this question with a nonzero response if an excessive amount of fragmentation is occurring (which can be determined from Online Test /18) or there is an excessive amount of generic alerts being issued for buffer pool empty conditions.

7 Respond to this question with Y only if the Question 562 response is 1 (LMI type of None) and you want to define DLCIs which have not been defined elsewhere.

The correct response for questions **3**, **4**, and **5** can be found in your Network Subscription Information.

16.3.7 Defining the 3174 APPN Resources

APPN Local Resource Definition

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 4
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point(614-615)
614 FP NAME - _____ 615 FP NETID - _____

Report to Alert Focal Point(616)
616 HOST LINKS - _ _ _ _ _

DLUS Primary Host Name(620-621)
620 CPNAME - RAI          621 NETID - USIBMRA

DLUS Backup Host Name(622-623)
622 CPNAME - _____ 623 NETID - _____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 258. APPN Node Definition Panel

Adjacent Network Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
        (1-4)    (X)   (1-5)
1 RAI_____ 1 3      5 2      _____ 0500 04
2 PCOM5250   1 3 X    1      4000 3174 9992 04 4 _____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 259. Network Resources

1 RAI is the CPNAME of the Subarea/APPN host. The link to the host is shared between T2.0 (for DSPU and coax devices) and T2.1 (for the APPN NN link).

2 A new DLC type has been introduced here, 5, indicating Frame Relay attachment. By specifying the CPNAME and associated parameters for RAI the 3174 will attempt to initiate a connection to this host immediately following an IML. The 3174 will also reserve resources for this link connection. Should a link failure occur, the 3174 will attempt to re-establish the CP-CP session. If host RAI is not specified on the Network Resources panel, the host link would be a T2.0 link only.

3 The downstream PU, PCOM5250, has been defined as a LEN Node and as such needs associated LUs defined. Note that a total of 120 nodes may have LU names defined.

4 The SAP here is used for the LEN link that will be carrying 5250 data stream between independent LUs. SAP '08'X is specified during the gateway DPSU customization as the local SAP for 3270 dependent LU sessions on the same physical workstation (same LAA). In other words, the 3174 has two links to the DOS PS/2: one for the DSPU link and another for the LEN link. From a link establishment standpoint, Personal Communications AS/400 and 3270 Version 4.0 for Windows logically contains 2 separate applications for 5250 and 3270 emulation. Each application is identified by an unique SAP since there is a single LAN adapter being used.

Associated LU

Associated LUs					
	CPNAME	LUNAME	LUNAME	LUNAME	SERVING NN
1	PCOM5250	PCOM5250			CP31742_

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

Figure 260. LUs Associated with LEN PCOM3270

The LU name associated with the LEN node PCOM5250 is defined here since there is no way for a LEN node to register LUs with a network node server.

To name a group of LUs using generic location naming, define them with a common name followed by an asterisk (*). This is commonly called a partial wildcard.

16.4 NCP Definitions

3174 Line and PU

```
*****
*          FRAME RELAY: PORTS: 1028 (IDNX), 084 (SA 7)
*                               1029 (SA 6), 016 (3174)
*****
G09FRPH1  GROUP FRELAY=(PHYSICAL,ANY),
          VIRTUAL=NO
*
** -> IDNX
*
L091028  LINE  ADDRESS=(1028,FULL),  LINE ADDRESS
          DUPLEX=FULL,             MODEM STRAPPING IS FULL
          NPACOLL=(YES,EXTENDED),
          MAXFRAME=4102,           MAXIMUM FRAME SIZE
          PORTADD=10,              PHYSICAL PORT ID
          SPEED=256000,            LINE SPEED
          ISTATUS=INACTIVE         INITIAL STATUS
*
P091028  PU    SRT=(65280,65280,NO),
          XMONLNK=YES,
          PUTYPE=1,
          LMI=ANSI,                ANSI TO IDNX
          ISTATUS=ACTIVE           INITIAL STATUS
*
*****
**BNN FR CONNECTIONS
*****
*
** -> PORT 1028
*
G09FRLB1  GROUP FRELAY=(LOGICAL,PER),
          AUTOGEN=10,              10 NODES
          CALL=INOUT,              CONN. ESTABLISHED FROM B
          LOCALTO=20,              REPLY TIMER
          PHYSRSC=P091028,
          TYPE=NCP,
          DIAL=YES,
          LNCTL=SDLC,
          LEVEL2=ECLNAVL2,
          LEVEL3=ECLNAVL3,
          LEVEL5=NCP,
          XIO=(ECLNAVXL,ECLNAVXS,ECLNAVXI,ECLNAVXK),
          LINEADD=NONE,
          LINEAUT=YES,
          NPACOLL=(YES,EXTENDED),
          PUTYPE=2,
          XMITDLY=NONE,
          COMPSWP=NO,
          COMPOWN=YES,
          RETRIES=(6,0,0)
```

Figure 261. NCP Definition for the Frame Relay Link to the 3174

1 In ACF/NCP V7R1, peripheral nodes such as PU T2.0 and PU T2.1 are now able to connect via a public or private frame relay network. From an SNA point of view, the logical lines will be switched, but the connection, as the defined in the frame relay network, is a Permanent Virtual Circuit (PVC) non switched. The figure given is the NCP definition used for this scenario. It contains two group macros: one for the physical connection and the other one for the logical connection.

AS/400 Line and PU

```

*****
*          LINE MACRO SPECIFICATION          SDLC LINK 000 FOR AS/400
*****
*          OLD LINE 20 - LAS400A - MODEM IN MODEM ROOM
*****
LAS400D LINE ADDRESS=(005,HALF), TRANSMIT AND RECEIVE
          NPACOLL=YES,
          ANS=CONTINUE,      DON'T BREAK CROSS DOMAIN
          ISTATUS=ACTIVE,
          DUPLEX=(FULL),     REQUEST TO SEND ALWAYS
          ETRATIO=30,        DEFAULT
          LPDATS=LPDA1,
          MAXPU=9,           ALLOW NO MORE THAN 9 PUS
          SERVLIM=2,
          SRT=(,64),
          SPEED=(4800)       LINE SPEED IS 4800 BPS
*          NGFTXT='AS/400A'
          SERVICE ORDER=(RA9P05),
          MAXLIST=9
*****
*          PU AND LU DEFINITIONS OF AS/400A TO SUPPORT DEPENDENT
*          AND INDEPENDENT LUS
*****
RA9P05  PU  ADDR=C4,          3270 ADDRESS='C' (EBCDIC)
          MAXDATA=265,        MAXIMUM AMOUNT OF DATA
          MAXOUT=7,           MAX SDLC FRAMES
          CONNTYPE=APPN,
          PACING=(7),         PACING SET BY BIND IMAGE
          ANS=CONTINUE,      KEEPS CROSS-DOMAIN RUNN
          PASSLIM=7,
          PUTYPE=2,
          RETRIES=(,1,4),     4 RETRIES, 1 SECOND BET
          DISCNT=(NO),        (V) VTAM ONLY
          VPACING=8,          (V) VTAM ONLY
          XID=YES
*          STATOPT='AS/400/A'
*****
RA9TNNAO LU  RESSCB=4,          INDEPENDENT LU
          LOCADDR=0,
          MODETAB=MTGS3X,
          DLOGMOD=MODS361,
          ISTATUS=ACTIVE
*          STATOPT='INDEPENDENT LU'
RA9TNNAI LU  RESSCB=4,          INDEPENDENT LU
          LOCADDR=0,
          MODETAB=MTGS3X,
          DLOGMOD=MODS361,
          ISTATUS=ACTIVE
*          STATOPT='INDEPENDENT LU'
RA9TNNAA LU  RESSCB=4,          INDEPENDENT LU
          LOCADDR=0,
          MODETAB=MTGS3X,
          DLOGMOD=MODS361,

```

Figure 262. AS/400 NCP Definition

The figure above shows the required NCP SDLC definition for the AS/400. The PU macro contains the parameter CONNTYPE=APPN to tell NCP that this PU supports APPN functions. Other parameters such as the station address and NRZI must match those specified at the Controller Definition on the AS/400. LUs defined here are not used for this scenario because 5250 emulation is created dynamically on the AS/400.

16.5 VTAM Definitions

Switched Major Node for the 3174 GW/NN and DSPUs

```

*****
*          RAI - PS/2 DSPU VIA 3174-GW          *
*****
SW9GW74B  VBUILD MAXGRP=5,          REQUIRED      X
              MAXNO=12,             REQUIRED      X
              MAXDLUR=4,            REQUIRED      X
              TYPE=SWNET             REQUIRED
**
*-----PU AND LU'S DEFINITION FOR 31742-GW -----
**
P9GW74B  PU 1  ADDR=C1,              COULD BE ANYTHING (NOT USED)  X
              MAXDATA=521,          PS/2  SYSTEM                  X
              DISCNT=NO,              X
              MAXOUT=7,               X
              NETID=USIBMRA,          X
              IDBLK=017,             X
              IDNUM=31742,            X
              CPNAME=CP31742,        X
              MAXPATH=2,             X
              PACING=(7,1),          X
              VPACING=8,             X
              PUTYPE=2,              X
              PASSLIM=7,             X
              ISTATUS=ACTIVE
**
S9GW74B  PATH  DLCADDR=(1,C,FRELAY), X
              DLCADDR=(2,D,10),      X
              DLCADDR=(3,X,4),       X
              DLCADDR=(4,D,500),     X
              PID=1,                 X
              USE=YES                 INITIALY ACTIVE
*
*-----DLU DEFINITION -----
*
S9GW74B2 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE
S9GW74B3 LU  LOCADDR=3,MODETAB=AMODETAB,USSTAB=US327X, X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE
*****
*          PCOM Version 4 and DOS/WINDOWS 3.1    *
*****
P9GW74B2 PU 1  ADDR=C2,              X
              MAXDATA=521,          X
              DISCNT=NO,            X
              MAXOUT=7,             X
              NETID=USIBMRA,        X
              IDBLK=05D,            X
              IDNUM=49992,          X
              CPNAME=PCOM5250,      X
              MAXPATH=2,           X
              PACING=(7,1),         X
              VPACING=8,            X
              PUTYPE=2,             X
              PASSLIM=7,            X
              ISTATUS=ACTIVE
**
S9GW74B2 PATH  DLCADDR=(1,C,FRELAY), X
              DLCADDR=(2,D,10),      X
              DLCADDR=(3,X,8),       X
              DLCADDR=(4,D,500),     X
              PID=1,                 X
              USE=YES                 INITIALY ACTIVE
*
*-----DLU DEFINITION -----
*
S9GW7422 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE
S9GW7423 LU  LOCADDR=3,MODETAB=AMODETAB,USSTAB=US327X, X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE

```

Figure 263 (Part 1 of 2). VTAM Switch Major Node Definition for Frame Relay with Gateway


```

*****
*          OS/2 2.1 and CM/2 1.1
*****
P9GW743  PU 1 ADDR=C2,                                X
              MAXDATA=521,                             X
              DISCNT=NO,                                X
              MAXOUT=7,                                 X
              NETID=USIBMRA,                             X
              IDBLK=05D,                                 X
              IDNUM=32273,                               X
              CPNAME=WTR32273,                           X
              MAXPATH=2,                                 X
              PACING=(7,1),                              X
              VPACING=8,                                 X
              PUTYPE=2,                                  X
              PASSLIM=7,                                 X
              ISTATUS=ACTIVE
*
S9GW74P2 PATH  DLCADDR=(1,C,FRELAY),
                DLCADDR=(2,D,10),
                DLCADDR=(3,X,C),
                DLCADDR=(4,D,500),
                PID=1,
                USE=YES                                INITIALLY ACTIVE
*
*-----DLU DEFINITION -----
*
S9GW7432 LU   LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X,      X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE
S9GW7433 LU   LOCADDR=3,MODETAB=AMODETAB,USSTAB=US327X,      X
              DLOGMOD=M2SDLCQ, ISTATUS=ACTIVE
**

```

Figure 263 (Part 2 of 2). VTAM Switch Major Node Definition for Frame Relay with Gateway

1 The figure shows the three PU definitions (one for the 3174 gateway and the other two for the DSPUs). Just like in a normal switched network, you must ensure that the IDBLK and IDNUM match those defined in every DSPU. The station address here is not used.

The IDBLK/IDNUM specified on the XID sent from the DSPU to the 3174 is forwarded to the host. This means that the IDBLK/IDNUM specified in VTAM for the DSPU PU must match what is defined at the DSPU. This is different from the SDLC and channel-attached gateways. For SDLC and the channel, IDBLK/IDNUM of the DSPU is not forwarded to the host.

16.6 AS/400 Definitions

Definitions to RAI

Line description	Display	Line Description	RA
Line description	>	RA9L005	Name
Resource names		LIN082	Name, *SAME
+ for more values			
Online at IPL	*YES		*SAME, *YES, *NO
NRZI data encoding	*YES 1		*SAME, *YES, *NO
Maximum controllers	1		1-254, *SAME
Clocking	*MODEM		*SAME, *MODEM, *LOOP
Line speed	9600		*SAME, 600, 1200, 2400
Modem type supported	*NORMAL		*SAME, *NORMAL, *V54..
Modem data rate select	*FULL		*SAME, *FULL, *HALF
Maximum frame size	2057		*SAME, 265, 521, 1033,
Error threshold level	*OFF		*SAME, *OFF, *MIN, *ME
Duplex	*FULL		*SAME, *HALF, *FULL
Modulus	8		*SAME, 8, 128
Maximum outstanding frames	7		1-28, *SAME
Inactivity timer	300		*NOMAX, 150-4200 (0.1
Poll response delay	0		0-2048 (0.0001 seconds)
Nonproductive receive timer	320		160-4200 (0.1 seconds)
Idle timer	30		5-300 (0.1 seconds)
Connect poll timer	30		2-300 (0.1 seconds)
Poll cycle pause	0		0-2048 (0.0001 seconds)
Frame retry	7		0-64, *SAME
Data Set Ready drop timer	6		*SAME, 3-60 (seconds)
Autoanswer type	*DTR		*SAME, *DTR, *CDSTL
Clear To Send timer	25		*SAME, 10-60 (seconds)
Remote answer timer	60		*SAME, 30, 35, 40 (seco
Link speed	9600		*SAME, *INTERFACE, *MIN
Cost/connect time	0		0-255, *SAME, *CNN
Cost/byte	0		0-255, *SAME, *CNN
Security for line	*NONSECURE		*SAME, *NONSECURE...
Propagation delay	*TELEPHONE		*SAME, *MIN, *LAN...
User-defined 1	128		0-255, *SAME
Text	:	SDLC Line to Subarea 09	

Figure 264. Line Definition for RAI

Controller description	Display	Controller Description	RA
Controller description	>	RA9P05	Name
Online at IPL	*YES		*SAME, *YES, *NO
APPN-capable	*YES 2		*SAME, *YES, *NO
Character code	*EBCDIC		*SAME, *EBCDIC, *ASCII
Maximum frame size	265		265-16393, 256, 265, 51
Remote network identifier	USIBMRA 2		Name, *SAME, *NETATR...
Remote control point	RAI 2		Name, *SAME, *NONE, *AN
Adjacent link station	*SAME		Name, *SAME, *NONE, *AN
SSCP identifier	*SAME		050000000000-05FFFFFFF
Station address	C4 1		01-FE, *SAME
APPN CP session support	*YES 2		*SAME, *YES, *NO
APPN node type	*NETNODE 2		*SAME, *CALC, *NETNODE.
APPN transmission group number	3 2		1-20, *SAME, *CALC
APPN minimum switched status	*SAME		*SAME, *VRYONPND, *VRYO
Autocreate device	*ALL		*SAME, *ALL, *DEVINIT,
Autodelete device	*NO		1-10000, 1440, *SAME, *
User-defined 1	*LIND		0-255, *SAME, *LIND
User-defined 2	*LIND		0-255, *SAME, *LIND
User-defined 3	*LIND		0-255, *SAME, *LIND
Recovery limits:			
Count limit	2		0-99, *SAME, *SYSVAL
Time interval	5		0-120 (minutes)
Recontact on vary off	*YES		*SAME, *YES, *NO
Text 'description'	:	'SNA Controller to sa09'	

Figure 265. Controller Definition for RAI

1 This contains the line and controller definition to represent RAI on the other side. The station address and NRZI **1** values in an SDLC environment must match those defined in LINE and PU macros in NCP. Parameters **2** are very important in this definition to have a support for APPN functions.

16.7 PS/2 Customization

16.7.1 Communications Manager/2 Workstation

The Communications Manager/2 PROTOCOL.INI and WTR32273.NDF file has been included as a reference.

CM/2 PROTOCOL.INI

```
PROT_MAN

    DRIVERNAME = PROTMAN$

LANDD_nif

    Bindings = IBMTOK_nif
    NETADDRESS = "T400000032273"
    ETHERAND_TYPE = "D"
    SYSTEM_KEY = 0x0
    OPEN_OPTIONS = 0x2000
    TRACE = 0x0
    LINKS = 8
    MAX_SAPS = 3
    MAX_G_SAPS = 0
    USERS = 3
    T1_TICK_G1 = 255
    T1_TICK_G1 = 15
    T2_TICK_G1 = 3
    T1_TICK_G2 = 255
    T1_TICK_G2 = 25
    T2_TICK_G2 = 10
    IPACKETS = 250
    UIPACKETS = 100
    MAXTRANSMITS = 6
    MINTRANSMITS = 2
    TCBS = 64
    GDTS = 30
    ELEMENTS = 800
    DriverName = LANDD$

IBMLXCFG

    LANDD_nif = LANDD.NIF
    IBMTOK_nif = IBMTOK.nif

IBMTOK_nif

    ADAPTER = "PRIMARY"
    MAXTRANSMITS = 12
    RECVBUFS = 10
    RECVBUFSIZE = 256
    XMITBUFS = 2
    XMITBUFSIZE = 2040
    DriverName = IBMTOK$
```

Figure 266. PS/2 CM/2 PROTOCOL.INI File

CM/2 WTR32273.NDF

```

DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.WTR32273 )
                  CP_ALIAS(WTR32273)
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN)
                  NODE_ID(X'05D32273')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  HOST_FP_LINK_NAME(HOST0001)
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK  LINK_NAME(HOST0001)
                     ADJACENT_NODE_TYPE(NN)
                     PREFERRED_NN_SERVER(YES)
                     DLC_NAME(IBMTRNET)
                     ADAPTER_NUMBER(0)
                     DESTINATION_ADDRESS(X'400031740002')
                     ETHERNET_FORMAT(NO)
                     CP_CP_SESSION_SUPPORT(YES)
                     SOLICIT_SSCP_SESSION(YES)
                     NODE_ID(X'05D32273')
                     ACTIVATE_AT_STARTUP(YES)
                     USE_PUNAME_AS_CPNAME(NO)
                     LIMITED_RESOURCE(NO)
                     LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                     MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                     EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                     COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                     COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                     SECURITY(USE_ADAPTER_DEFINITION)
                     PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(USIBMRA.RALYAS4A)
                   PARTNER_LU_ALIAS(5250PLU)
                   MAX_MC_LL_SEND_SIZE(32767)
                   CONV_SECURITY_VERIFICATION(NO)
                   PARALLEL_SESSION_SUPPORT(YES);

DEFINE_MODE  MODE_NAME(QPCSUPP)
             COS_NAME(#CONNECT)
             DEFAULT_RU_SIZE(NO)
             MAX_RU_SIZE_UPPER_BOUND(1024)
             RECEIVE_PACING_WINDOW(7)
             MAX_NEGOTIABLE_SESSION_LIMIT(32767)
             PLU_MODE_SESSION_LIMIT(64)
             MIN_CONWINNERS_SOURCE(32)
             COMPRESSION_NEED(PROHIBITED)
             PLU_SLU_COMPRESSION(NONE)
             SLU_PLU_COMPRESSION(NONE);

DEFINE_DEFAULTS  IMPLICIT_INBOUND_PLU_SUPPORT(YES)
                 DEFAULT_MODE_NAME(BLANK)
                 MAX_MC_LL_SEND_SIZE(32767)
                 DIRECTORY_FOR_INBOUND_ATTACHES(*)
                 DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
                 DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
                 DEFAULT_TP_CONV_SECURITY_RQD(NO)
                 MAX_HELD_ALERTS(10);

START_ATTACH_MANAGER;
                   SLU_PLU_COMPRESSION(NONE);

```

Figure 267. PS/2 CM/2 WTR32273.NDF File

16.7.2 DOS PS/2 Customization

Customization of Personal Communications AS/400 and 3270 Version 4.0 for Windows in this scenario was relatively simple. Refer to the Personal Communications AS/400 and 3270 Version 4.0 for Windows product publications for additional information.

Defining Link to S/390 for 3270 Sessions

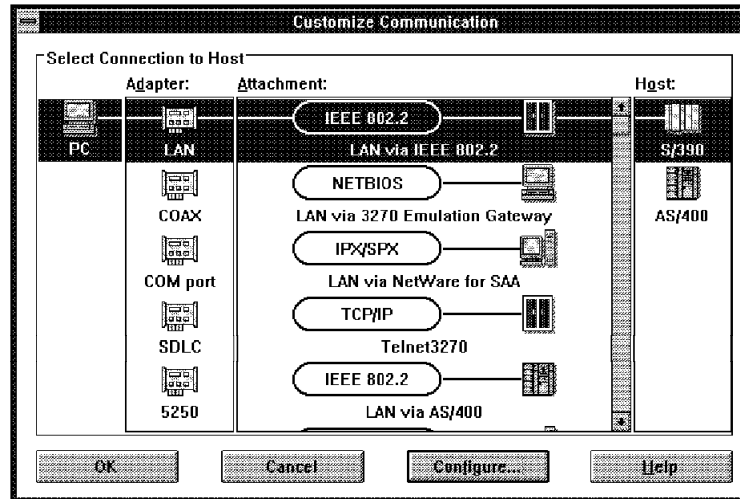


Figure 268. Personal Communications AS/400 and 3270 Version 4.0 for Windows Setup for a S/390 Host.

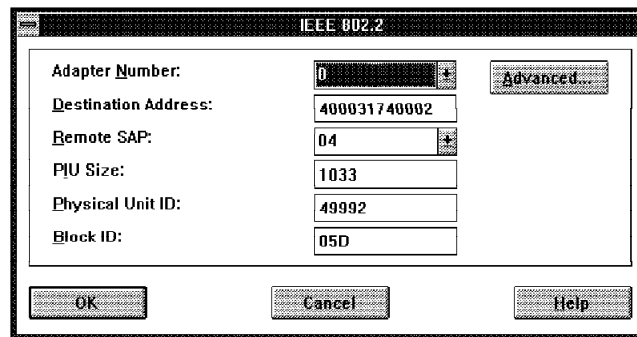


Figure 269. Link Configuration.

The Destination Address and Remote SAP must match those coded on panel 940 (LAN Address Assignment customized on the 3174).

The Physical Unit ID and Block ID must match those coded in VTAM, matching the IDNUM and IDBLK parameters.

The PIU size should match the transmit I-frame size in Question 941 of the 3174 LAN Transmission Definition customization for this DSPU.

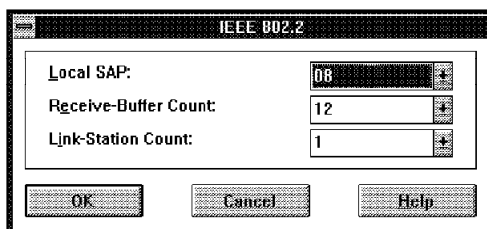


Figure 270. Advanced Link Configuration.

The Local SAP must match that coded on the Gateway Ring Address Assignment panel (Question 940) during the 3174 customization.

Defining Link to AS/400 for 5250 Session

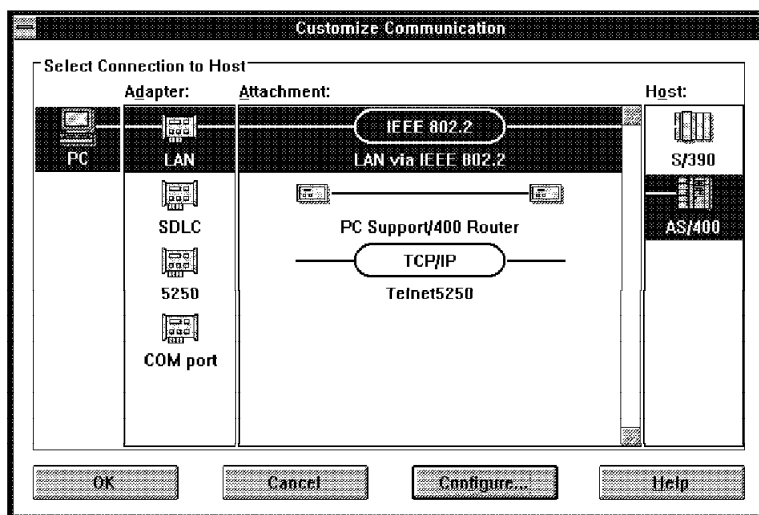


Figure 271. Personal Communications AS/400 and 3270 Version 4.0 for Windows Setup for an AS/400 Host.

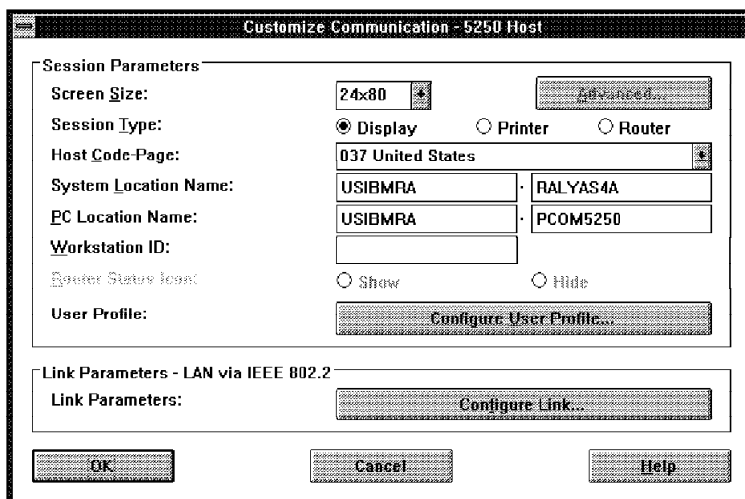


Figure 272. Customizing an AS/400 Connection.

Figure 273. Link Configuration.

We are using the default SAP X'04' for the LEN connection to the 3174 for 5250 emulation to and from AS/400, so we do not need to select Advanced on this panel.

DOS Workstation PROTOCOL.INI

```

PROTMAN_MOD
  DriverName = PROTMAN
DXMAIDXCFG
  DXMEO_NIF = DXMEO.NIF
  DXMJOMOD_NIF = DXMJOMOD.NIF
  SMCDOSJP_NIF = SMCDOSJP.NIF
  SMCDOSJP2_NIF = SMCDOSJP.NIF
  SMCDOSAT_NIF = SMCDOSAT.NIF
  SMCDOSAT2_NIF = SMCDOSAT.NIF
  SMCDOSMC_NIF = SMCDOSMC.NIF
  SMCDOSMC2_NIF = SMCDOSMC.NIF
DXMEO_NIF
  DriverName = DXMEO
  Bindings = IBMTOK_MOD
IBMTOK_MOD
  DriverName = IBMTOK
  EARLYRELEASE
  MAXTRANSMITS = 6
  RECVBUFS = 2
  RECVBUFSIZE = 256
  XMITBUFS = 1
  XMITBUFSIZE = 2040

```

Figure 274. DOS PS/2 PROTOCOL.INI File

DOS Workstation CONFIG.SYS

```

DEVICE=C:\WIN\HIMEM.SYS
DOS=HIGH
DEVICE=C:\DOS61\SETVER.EXE
DEVICE=C:\WIN\EMM386.EXE NOEMS
FILES=50
BUFFERS=20
LASTDRIVE=Z
DEVICE=C:\WIN\SMARTDRV.EXE /DOUBLE_BUFFER
STACKS=9,256
DEVICE=C:\LSP\PROTMAN.DOS /I:C:\LSP
DEVICE=C:\LSP-IBMTOK.DOS
DEVICE=C:\LSP\DXMAOMOD.SYS 001
DEVICE=C:\LSP\DXMEOMOD.SYS N 400031749992 1
DEVICE=C:\LSP\DXMTOMOD.SYS ES=3 EST=3 O=N

```

Figure 275. DOS PS/2 CONFIG.SYS File

1 The locally administered address inserted as part of the IBM LAN Support Program Version 1.33 installation process

The Proof



Figure 276. The Proof.

16.8 Verification from the 3174 Perspective

Frame Relay Test Menu

_____ Frame Relay Test Menu _____

Option	Description
1	Display Frame Relay port summary information
1 2,p	Update Frame Relay Parameters
3	List all DLCI status and data type
4,n	List specific DLCI status summary
5	Display link status summary

p = RAS password
n = DLCI number (decimal)

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 12=Test Menu

Figure 277. The Frame Relay Test Menu

Option 18 from the main 3174 test menu selects the Frame Relay Test Menu panel.

1 Option 2 allows dynamic update of the Transmit polling interval and Committed Information Rate provided that a password has been set up in customization Question 98. Beware though that these changes are not permanent. When the 3174 is re-IMLed, the values from customization are restored to the customized values.

Display Frame Relay Port Summary

```
_Display Frame Relay port summary information_

Frame Relay DLC Management Interface
LMI Type..... Annex-D      Address Format..... 004
Address Length..... 002      1 Transmit Polling Interval.. 005
Full Status Polling Cycles. 006 2 Error Threshold..... 003
Monitored Events..... 004      Max Supported VCs..... 020
Multicast..... N

Physical Layer Errors
FCS Errors..... 0000000000 Transmit Underrun Errors... 0000000000
Receive Overrun Errors.... 0000000070 Aborted Frames..... 0000000000


To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  5=Refresh  12=Test Menu
```

Figure 278. Frame Relay Port Summary Display

1 This is the T391 timer which can be configured in Question 563 on the Frame Relay Description panel as the LMI Transmit Polling Interval. The default value is 10 seconds. The value of this timer can be changed dynamically in the password protected option 18/2 in the online test menu.

2 After six LIV (Link Integrity Verification) status inquiries, a full status report is requested. When this number is set to 5, the inquiry is every 30 seconds.

DLCI Status and Data Types

____List all DLCI status and data types____		
DLCI Number 1	LINK Status 2 (New/Active)	Data Type(s) Received and Processed
Decimal / Hex / Q.922	-----	-----
0500 / 1F4 / 7C41	ACTIVE	SNA 3
0501 / 1F5 / 7C51	ACTIVE	**Not determined yet
0502 / 1F6 / 7C61	ACTIVE	**Not determined yet
0503 / 1F7 / 7C71	ACTIVE	**Not determined yet
0504 / 1F8 / 7C81	ACTIVE	**Not determined yet
0505 / 1F9 / 7C91	ACTIVE	**Not determined yet
Note: FECN, BECN and DE are set to zero for Q.922 DLCI display format		
To go directly to other tests, enter: /Test,Option		
Select Test; press ENTER ==>		
PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu		

Figure 279. DLCI Status and Data Types

1 DLCIs are configured or customized in decimal. Here they are translated to Hex and Question 922 standard format which can be very useful when analyzing traces. NCP line traces contain the Question 922 format. SNA traces contain the Hex format.

2 NEW is displayed as the link status until a full status report is received after IML or for as long as a DLCI, which is defined in the 3174, is not reported as active. In the active state the 3174 is sending test frames to its partner and is waiting for a response in order to proceed with link activation.

3 Without source route bridging, Data Type for a DLCI can be either SNA or IP or both. Any of these states indicate that the 3174 has received a frame with valid NLPID (Network Layer Protocol Identifier) in the RFC 1490 header.

Specific DLCI Status Summary

```
_____List specific DLCI status summary_____

DLCI number..... 0500
State ..... ACTIVE
FECN frames received..... 0000000000 1
BECN frames received..... 0000000000 1
Frames sent..... 0000004599
Octets sent..... 0000185017
Frames received..... 0000004602
Octets received..... 0000326938
Circuit creation time (DDD HH:MM)... 000 03:45
Time of last circuit state change... 000 03:46
Throughput..... 0000000000
Committed Information Rate (CIR).... 0000256000
Number of fragments received..... 0000000000 2

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu
```

Figure 280. Status Summary for DLCI 0500

1 FECN and BECN (Forward and Backward Explicit Congestion Notification) information will be present only if Congestion Control is specified in Question 558 on the Frame Relay Definition panel.

2 Fragmentation occurs when frames that are larger than the frame relay network's maximum size are transmitted across the network. As fragmentation and reassembly degrades performance, we do not recommend this to be used normally.

Link Status Summary

Link Status Summary			
Host ID/DLCI/RSAP	1A 01F4 04	1	
Trans I-Frames	0000057B	2	
Rec I-Frames	00000432	3	
Transmit Errors	00000000	5	
Received Errors	00000000	6	
T1 Expired	00000088	7	
Com/Res Ind	08 18	8	
To go directly to other tests, enter: /Test,Option Select ==>			
PF: 3=Quit 5=Refresh 12=Test Menu			

Figure 281. Link Status Summary for DLCI 0500 (Hex 01F4)

- 1** RSAP (Remote Service Access Point) is the SAP associated with the partner link connection.
- 2** The number of information format logical link control protocol data units (LPDUs) that have been sent, including all retransmissions. The counter is reset when the link is initialized.
- 3** The number of LPDUs which have been received, including any that are valid but out of sequence.
- 4** The number of times a link station detects an error that requires retransmission of an I-frame.
- 5** The number of I-frames received in error, not including those with an invalid frame check sequence.
- 6** The number of times the T1 or reply timer expired which is used to detect the failure to receive a required acknowledgement from a remote link station.
- 7** T1 Expired shows the number of times that the T1 or reply timer has expired. This is used to detect the failure to receive a required acknowledgement from a remote link station.
- 8** The Com/Res Ind shows the hexadecimal value of the last command/response received and sent, together with the format of these commands or responses.

DLCI Status and Data Types

____List all DLCI status and data types____		
DLCI Number	LINK Status	Data Type(s)
Decimal / Hex / Q.922	(New/Active)	Received and Processed
-----	-----	-----
0500 / 1F4 / 7C41	ACTIVE	SNA
0501 / 1F5 / 7C51	ACTIVE	SNA
0502 / 1F6 / 7C61	ACTIVE	**Not determined yet
0503 / 1F7 / 7C71	ACTIVE	**Not determined yet
0504 / 1F8 / 7C81	ACTIVE	**Not determined yet
0505 / 1F9 / 7C91	ACTIVE	**Not determined yet
Note: FECN, BECN and DE are set to zero for Q.922 DLCI display format		
To go directly to other tests, enter: /Test,Option		
Select Test; press ENTER ==>		
PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu		

Figure 282. Link Status for All DLCIs Known to the 3174

3270 Host Status Summary

____ 3270 Host Status Summary ____				
ID	Host Descriptor	HG	Attach	Connection Status
1A	RAI SA9	11	None	500-02 Up
To go directly to other tests, enter: /Test,Option				
Select Test; press ENTER ==>				
PF: 3=Quit 5=Refresh 12=Test Menu				

Figure 283. 3270 Host Status Summary for Frame Relay

Gateway Host Status

```
Gateway Host Status Summary   Host ID = 1A

Customized Links - 003

  Host      Link      LAN      Host      Link      LAN
Address    Status    Address    Address    Status    Address
01F4 04    00      400031740002 04    01F4 08    02      400031749992 08
01F4 0C    02      400000032261 04

To go directly to other tests, enter: /Test,Option
Select ==>

PF: 3=Quit 12=Test Menu
```

Figure 284. Gateway to Host Link Status

Port Connectivity

```
_____ Connectivity for PN 01, HG 26 _____

Adapter (HG) status:      Enabled
Port (PN) status:        Powered on
Device type:              Video display (MLT)

Current connectivity-

      LT    Bound    Host    IDn    HG_PN    Host/Station Name
      1     Yes     003     1A1     11       RAI SA9
      2     No      009     1A2     11       RAI SA9
      3     Yes     012     1A3     11       RAI SA9
ACTIVE 4     No      015     1A4     11       RAI SA9
      5                                     LT not defined

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu
```

Figure 285. MLT Port Connectivity Status

Adjacent Nodes

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
1	USIBMRA	RAI	NN	OPEN	08	1	YES
3	USIBMRA	WTR32261	EN	OPEN	08	1	YES
5	USIBMRA	PCOM5250	LN	OPEN	08	1	NA

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 286. Adjacent Nodes

16.9 Verification from the Host Perspective

Host Topology Summary

TOPO1								TOPOLOGY SUMMARY			
				BN	NATIVE						
				NO	YES						
TRANSMISSION GROUPS ORIGINATING AT CP USIBMRA.RAI											
								CPCP			
DESTINATION CP	TGN	STATUS	TGTYPE	VALUE	WEIGHT						
USIBMRA.RALYAS4A	3	OPER	INTERM	YES	*NA*						
USIBMRA.CP31742	21	OPER	INTERM	YES	*NA*						

Figure 287. Topology Summary Status of Adjacent CPs to RAI

In this scenario, since RAI serves as the link between the NN servers CP31742 and RALYAS4A, it needs to have a CP-CP session with the two. VTAM command V NET,TOPO,ID=RAI,LIST=ALL, shows you the different CPs adjacent to RAI and their status as shown in the figure.

NLDM Session Configuration: Previous Figure 288 on page 268 and Figure 289 on page 268 are taken using NLDM. The NLDM session configuration screen provides you with lots of information pertaining to the session, such as the PUs, where they are attached, and the logmode/COS used in the session. Remember, however, that the PU nodes shown in NLDM for the LUs in session are the ones adjacent to VTAM and may not be the actual PU or network node server. In other words, intermediate nodes are not displayed unless they are adjacent to VTAM.

PRIMARY				SECONDARY			
NAME	PCOM5250	SA	00000009	EL	0208	NAME	RALYAS4A SA 00000009 E
DOMAIN	RAIAN	PCID	USIBMRA.CP31742.EE4B79FF00000007				DOMAIN
P091028	CP/SSCP	---	---	SUBAREA	PU	RA9NCPW	
	LOCAL DATA	APPN TP 01					
		SUBA TP 00					
		VR 00					
J0009011	LINK	ER 00		LINK		LAS400D	
		RER 00					
		APPNCOS #CONNECT					
P9GW74B (006F)	PU	LOGMODE QPCSUPP		PU		RA9P05	
		PADJ CP CP31742					
		SADJ CP RALYAS4A					
PCOM5250(0208)	ILU			ILU		RALYAS4	

Figure 288. Session Configuration between PCOM5250 and RALYAS4A

PRIMARY				SECONDARY			
NAME	WTR32273	SA	00000009	EL	0209	NAME	RALYAS4A SA 00000009 E
DOMAIN	RAIAN	PCID	USIBMRA.WTR32273.F1FB38D877B10459				DOMAIN
P091028	CP/SSCP	---	---	SUBAREA	PU	RA9NCPW	
	LOCAL DATA	APPN TP 01					
		SUBA TP 00					
		VR 00					
J0009011	LINK	ER 00		LINK		LAS400D	
		RER 00					
		APPNCOS #CONNECT					
P9GW74B (006F)	PU	LOGMODE QPCSUPP		PU		RA9P05	
		PADJ CP CP31742					
		SADJ CP RALYAS4A					
WTR32273(0209)	ILU			ILU		RALYAS4	

Figure 289. Session Configuration between PCOM5250 and RALYAS4A

16.10 Verification from the AS/400 Perspective

Display Session PCIDs					
Job:	PCOM5250	Control	Network	Number:	000307
Opt	PCID	Point	ID	Mode	Status
	EE4B79FF00000007	CP31742	USIBMRA	QPCSUPP	Active
					System: R
Job:	WTR32273	Control	Network	Number:	000305
Opt	PCID	Point	ID	Mode	Status
	F1FB38D875B10459	WTR32273	USIBMRA	QPCSUPP	Active

Figure 290. AS/400 APPN End Point Sessions

1 APPN sessions terminating to an AS/400, as shown previously, can be verified by going to the DSPAPPNINFO panel and selecting the ENDPOINT option.

Chapter 17. APPN over X.25

With the addition of APPN over X.25 support for the 3174, we can build more complex networks. As a DTE, the 3174 NN may have multiple virtual circuits that communicate across an X.25 network to remote DTEs that may be LEN nodes, APPN NNs, or APPN ENs. The 3174 uses the QLLC protocol layer and supports Permanent Virtual Circuits (PVCs) and Switched Virtual Circuits (SVCs). The SVCs are persistent and remain connected once established.

17.1 Configuration

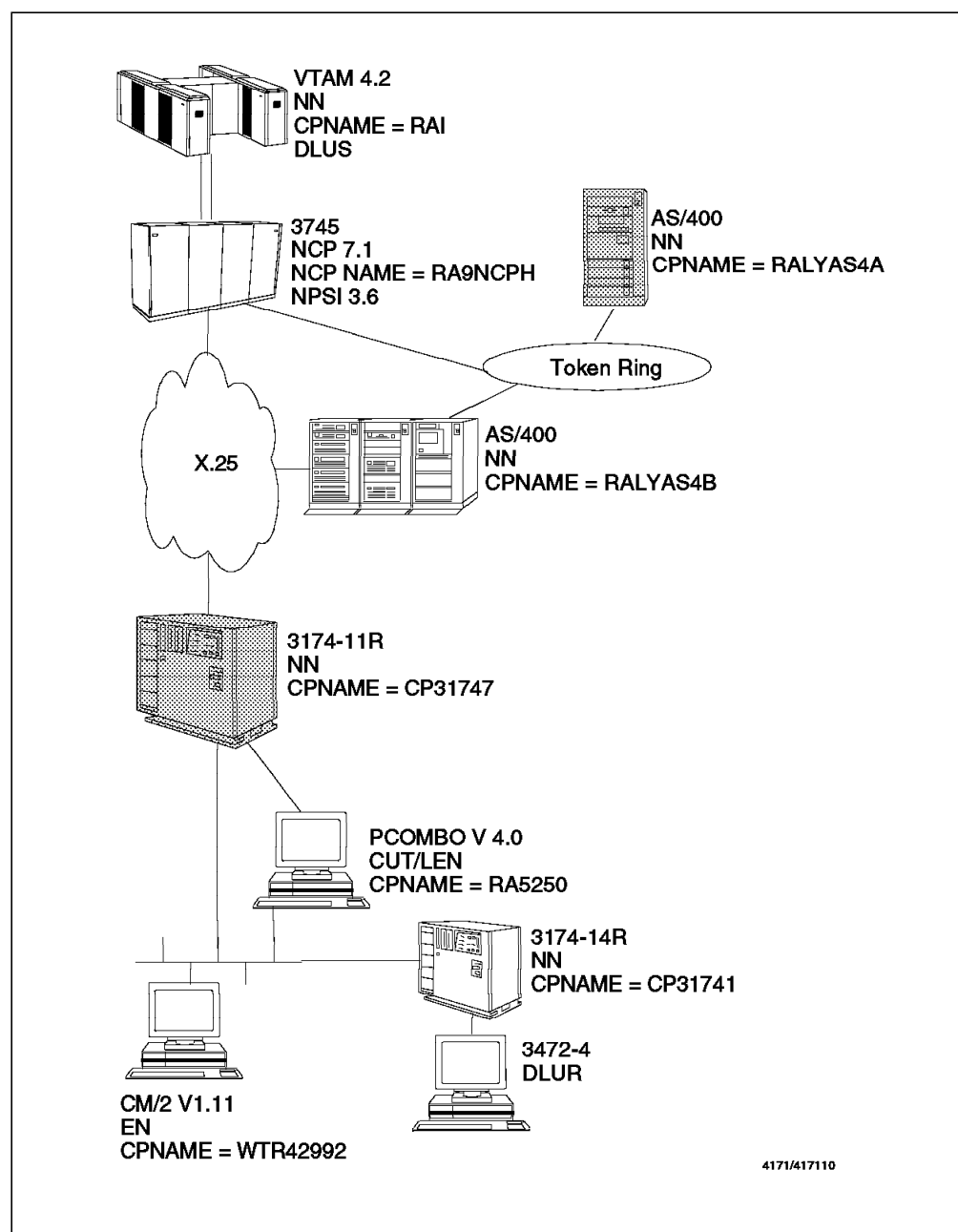


Figure 291. X.25 with APPN

17.2 Definition Overview

We used an Ethernet LAN in this environment. Both 3174s are customized for APPN and have a DLUS host defined. Personal Communications AS/400 and 3270 Version 4.0 for Windows, installed on the PS/2 customized as a CUT display for 3270 communications with a 3270 host and as a LEN node for 5250 communications with an AS/400. The CUT 3270 emulation is via coax attachment to the 3174. The LEN 5250 emulation is via Ethernet LAN through the 3174. Communications Manager/2 on the PS/2 is customized as a EN node and attached via Ethernet to the 3174.

CP31747 (3174-11R) is adjacent to RAI (the DLUS host). This means that there are two links that must be established. One link for the physical connection and another for the virtual DLUR-DLUS connections.

CP31741 (3174-14R) is not adjacent to RAI, the DLUS host, thus only the single virtual DLUR-DLUS link needs to exist.

Note that the maximum speed for the X.25 connection is limited to 64 Kbps.

The LAN adapter is now optional for the APPN feature.

17.3 3174-11R Customization

The 3174-11R in this scenario is a network node and cluster controller. It can not be a gateway, since the X.25 gateway RPQ is not supported for Configuration Support-C5.

17.3.1 Defining the 3174-11R Attachments

Model/Attach

Model / Attach

Online Test Password 098 -

Product Assistance Data 099 -

3174 Model 100 - 11R

Host Attachment 1 101 - 3 1-BSC 6-SDLC, X.21 Switched 2-SDLC 7-Token-Ring 3-X.25 8-Ethernet 4-Non-SNA Channel 9-Frame Relay 5-SNA Channel M-Multi-host

LAN adapter type 2 102 - 2 0-none 1-Token-Ring 2-Ethernet

NSO selection 103 - 0000000000000000

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

Figure 292. Model/Attach for X.25 to Host and Ethernet LAN

- 1 A 3 response indicates that X.25 support is to be used over the link. APPN over X.25 is also supported when Mutli-host (M) is the Host Attachment.
- 2 Ethernet is not supported for 3174 Models 01L, 01R, 02R or 03R.

Defining the Ethernet Attachment

```

_____ Ethernet Description _____

Ethernet Address      1 084 - 4000 3174 0007

Ethernet media type   2 086 - 2    2-10base2
                               5-10base5
                               T-10baseT

Ethernet frame format 3 088 - 3    1-IEEE 802.3
                               2-Ethernet V2
                               3-Both

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu

```

Figure 293. Ethernet Description for Downstream Links

1 The Ethernet address can be locally administered, universal, or all zeros. The all zeros option allows the registered universal address built in to the adapter to be used. Beware though that if a universal address is used and the Ethernet adapter has to be replaced, the 3174 and gateway will have to be customized with the new address.

2 There is no default response to this question. The Ethernet adapter has three physical connectors (one for each media type) and the response will determine which is to be used.

3 The default response is 1. If the remote hosts that communicate with the 3174 use only one of the supported frame formats (IEEE 802.3 or Ethernet Version 2), select the appropriate frame format. It is not recommended that both formats are selected unless the hosts use both or you are not certain which they use.

Defining the X.25 Link to Host

```

_____ X.25 _____

104 - C1 1 108 - 0000000 110 - 0 0001 116 - 1_ _
121 - 01 123 - 0 125 - 00000000 126 - 00000000 127 - 0 0
132 - 0 0 0 0 136 - 1 0 0 1 137 - 0 0 0 0 138 - 0
141 - A 165 - 1 166 - A 168 - 0
172 - 0 173 - 00000000 175 - 179 - 0 0 0
213 - 1 215 - 31747 220 - 0 365 - 0
370 - 0 372 - 1 0

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu

```

Figure 294. X.25 Link Definition to the Host

1 This is the X.25 secondary station address. When connecting to VTAM APPN or VTAM LEN nodes on SDLC or channel links, the 3174 is always the secondary station. This is not negotiable.

17.3.2 Enabling 3174 APPN

```

_____ Common SNA _____

500 - 0          501 - USIBMRA      502 - _____

APPN Support Fields:

510 - 1          511 - CP31747      512 - VNET3174

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 295. Enabling 3174 APPN

17.3.3 X.25 Circuit Definitions

Circuit Definition for Host Link

```

_____ 332: X.25 Options _____

1 400 - 00 1 0    2 401 - 4          402 - ____
3 409 - 10100100  4 420 - 10000000    5 421 - 10000000
6 423 - 101100201_____ 7 424 - 201001400_____
430 - 1          431 - 0          432 - 07          433 - 7
434 - 1          435 - 07
440 - A          441 - ____        442 - ____
450 - 0300       451 - 10         452 - _____ 453 - 10000000 8
461 - ____       462 - ____ 9 463 - 0002 10 464 - 0008
465 - ____       466 - ____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 296. X.25 Circuit Definitions for Host Link

1 The response to this question determines the type of network that is attached to the 3174. Ours is one supporting CCITT recommendations and adhering to the 1984 level.

2 Our circuit supported two-way call. Option 4 is the default. Other possibilities are as follows:

- 1 = Permanent Virtual Circuits (PVCs)
- 2 = Incoming call (from host) only (SVC)
- 3 = Outgoing call (to host) only (SVC)

3 This determines the X.25 Keyboard Support options, in our case we took the default. This field allows the choice of how to use the X.25 Extension Mode keys for this virtual circuit. For detailed information please refer to *3174 Functional Description*, GA23-0218.

4 The first digit here specifies that the 3174 will validate the calling DTE address on incoming calls.

5 The first digit specifies that the 3174 will supply its DTE address in the outgoing Call Request Packet.

6 This field contains the host network data terminating equipment (DTE) address.

7 The 3174 DTE address is entered here. This is used only if the first digit of the response to Question 421 is 1 (indicating the 3174 call address is to be sent in the call address packet) and the response to Question 401 is 3 or 4 (indicating the 3174 can make outgoing calls).

8 The first digit determines which level of CCITT architecture is in use, and the second determines what type of diagnostic codes the 3174 should use for Clear Request or Request Packets when breaking the connection with the remote DTE.

9 This is the lowest two-way SVC channel address supported. Since logical channel number (LCN) 1 to 3 are used for a PVC connection in our network, the lowest two-way channel LCN for the SVC connections is 3.

10 The highest two-way channel address as specified in our subscription to the network.

The response to the remaining questions can be determined from your network subscription information, with reference to the *3174 Planning Guide for Configuration Support-C Release 5*, GA27-3918.

17.3.4 WAN Profiles

X.25 Circuit Profiles for Adjacent Nodes

```

_____ X.25 Circuit Profiles _____

1  401 - 4
    420 - 10000000      421 - 10000000
    430 - 1             432 - 07
    440 - A             441 - ____      442 - ____
    453 - 10000000

2  401 - 4
    420 - 10000000      421 - 10000000
    430 - 1             432 - 07
    440 - A             441 - ____      442 - ____
    453 - 10000000

Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu
```

Figure 297. X.25 Circuit Profiles for Adjacent Nodes

A maximum of 16 profiles with different virtual circuit characteristics can be defined for X.25 WAN communication. These profiles can be used by the X.25 APPN Node Definition to match network subscription parameters for X.25 APPN connections.

The meaning of the questions are the same as those shown in Figure 296 on page 272.

17.3.5 APPN Network Definition

APPN Node Definition

```

_____ APPN Node Definition _____

        610 SESSIONS - 1          611 NODES/LINKS - 1
        612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point 614-615
1 614 FP NAME - RALYAS4A          615 FP NETID - USIBMRA

Report to Alert Focal Point 616
2 616 HOST LINKS - 1A _ _ _ _ _

DLUS Primary Host Name 620-621
620 CPNAME - RAI                621 NETID - USIBMRA

DLUS Backup Host Name 622-623
622 CPNAME -                    623 NETID -

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 298. APPN Node Definitions for MS and DLUS

1 We included a name here for the focal point to which this 3174 NN reports any network management alert information (both for itself and any served ENs). As the focal point is an AS/400, the focal point name is its CPNAME. This would also be the case if it were NetView Version 2 Release 4 or higher using VTAM Version 4 Release 1 or higher; otherwise the focal point name for NetView would be its LUNAME.

2 This indicates the host links for dependent LUs whose alerts are sent to the APPN focal point. If left blank, the only alerts sent to the focal point are those from the served end nodes and those from the 3174 PU itself.

Defining Adjacent Nodes

```

_____ Network Resources _____

        CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
                   1-4      X      1-5
1 RA5250_      1          X      1      4000 3174 4992 04  _ _
1 2 RALYAS4B    3          -      4          _ _ _ _ _ _
3 CP31741_     3          -      1      4000 3174 0001 04  _ _
1 4 RAI_       3          -      4          _ _ _ _ _ _

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 299. Defining Adjacent Nodes

1 The DLC type of 4 for RALYAS4A and RAI indicate these connections are X.25. As such, they will be presented in the X.25 APPN nodes panel shown in Figure 300 for allocation of a circuit profile.

X.25 APPN Nodes

X.25 APPN Nodes					
	CPNAME	PROFILE	CONNECTION ID	LCN	DTE ADDR
1	1 RALYAS4B	01	_____	_____	201001209_____
2	2 RAI	1A	_____	_____	101100201_____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

Figure 300. Definition for X.25 Attached Adjacent Nodes

1 The profile used for RALYAS4A, 01, is specified on the X.25 Circuit Profile panel. See Figure 297 on page 273 for the WAN profile used in this scenario.

2 Host RAI is connected on the primary host link (defined on the X.25 and X.25 Options panels).

As both are Switched Virtual Circuits, LCN (Logical Channel Number) is not required; the DTE address, however, is needed.

Associated LUs

Associated LUs						
	CPNAME	LUNAME	LUNAME	LUNAME	LUNAME	SERVING NN
1	RA5250	RA5250_	_____	_____	_____	CP31747_

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 301. Associated LUs for RA5250

Only RA5250, a PS/2 running Personal Communications AS/400 and 3270 Version 4.0 for Windows, is a LEN node requiring definition of associated LUs.

17.4 3174-14R Customization

17.4.1 Defining the 3174-14R Attachment

Model/Attach

```

_____ Model / Attach _____

Online Test Password    098 -

Product Assistance Data
099 - 3174 TEST MACHINE ID 0001 RALEIGH ITS0

3174 Model             1 100 - 14R

Host Attachment        101 - 8      1-BSC           6-SDLC, X.21 Switched
                                2-SDLC           7-Token-Ring
                                3-X.25         8-Ethernet
                                4-Non-SNA Channel 9-Frame Relay
                                5-SNA Channel  M-Multi-host

LAN adapter type       102 - 2      0-none
                                1-Token-Ring
                                2-Ethernet

NS0 selection          103 - 0000000000000000
Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu

```

Figure 302. Model/Attach to Ethernet LAN

1 3174 models 14R, 24R and 64R can be used with the Ethernet host attachment.

Defining the Ethernet Attachment

```

_____ Ethernet Description _____

Ethernet Address        084 - 4000 3174 0001

Ethernet media type     086 - 2      2-10base2
                                5-10base5
                                T-10baseT

Ethernet frame format   088 - 3      1-IEEE 802.3
                                2-Ethernet V2
                                3-Both

Select Test; press ENTER ==>

PF:  3=Quit  7=Back 8=Fwd 12=Test Menu

```

Figure 303. Ethernet Description for the 3174-14R

Ethernet LAN definitions

```

_____ Local Area Network _____

1 106 - 4000 3174 0001 04 2 107 - 4000 3174 0007 04 108 - 00000000

110 - 0 0000          116 - 0 _ _

121 - 01 123 - 0      125 - 00000000      126 - 00000000 127 - 0 0

132 - 0 0 0 0        136 - 1 0 0 1      137 - 0 0 0 0 138 - 0

141 - A              165 - 0              166 - A          168 - 0

172 - 0 173 - 00000000 175 -              179 - 0 0 0

213 - 1              215 - 31741          220 - 0

382 - 0521           383 - 2

385 - IBMLAN         386 - 1

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 304. Ethernet LAN Definitions

1 This response is taken from the Ethernet Description panel (Figure 303 on page 276) and cannot be changed here.

2 Since the 3174-11R is not and cannot be a gateway, the link to the 3174-14R can only be an APPN link. This makes the address supplied here irrelevant.

17.4.2 Enabling 3174 APPN

```

_____ Common SNA _____

500 - 0      501 - USIBMRA      502 - _____

APPN Support Fields:

510 - 1      511 - CP31741_    512 - VNET3174

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 305. Enabling 3174 APPN

17.4.3 Defining the 3174 APPN Resources

3174 Local APPN Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 1          611 NODES/LINKS - 1
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point 614-615
614 FP NAME - _____ 615 FP NETID - _____

Report to Alert Focal Point 616
616 HOST LINKS - _ _ _ _ _

DLUS Primary Host Name 620-621
1 620 CPNAME - RAI          621 NETID - USIBMRA

DLUS Backup Host Name 622-623
622 CPNAME - _____ 623 NETID - _____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 306. APPN Node Definition for the 3174-14R

1 The link to the 3174-11R (CP31741) is a T2.1 link. This means that the 3174-14R must have DLUS/DLUR enabled to service the devices that are directly attached as CUT devices.

Defining Adjacent Resources

```

_____ Network Resources _____

CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
      1-4      X      1-5

1 CP31747_  3      _      1      4000 3174 0007 04  _ _

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 307. Defining Adjacent Nodes for the 3174-14R

As the only device attached to this controller was a dependent display, the only definition required here is that of the adjacent network node 3174-1.

17.5 NCP and NPSI Definitions

Only the portion of the NCP/NPSI generations that deals with SVC links utilized by the 3174 in this scenario is presented here.

The full generation appears in Appendix F, "Supplemental Information for Scenarios" on page 469 in Figure 520 on page 469.

```
X.
*****
*      SVCSC LINES FOR SHM
*****
L08X21  X25.LINE TYPE=S,
          DSTNODE=INN,
          ISTATUS=INACTIVE,
          TRANSFR=34,
          CALL=INOUT
P08X21A X25.PU PUTYPE=4
*
*
*****
*      SVC' S 3 - 20 X25NET
*****
          X25.VC LCN=(3,20),      18 SWITCHED VC'S
          ANS=CONT,              SESSION CONTINUATION
          CALL=INOUT,
          NCPGRP=G08X3,
          OUFINDX=1,
          TYPE=S,                SWITCHED
          VCCINDX=1
*****
```

Figure 308. SVC Portion to the NCP/NPSI Generation

17.6 VTAM Definitions for CP31747 and CP31741

In this scenario, two switched major nodes definitions are required to connect the CP31747 to VTAM since the DLUR-DLUS are adjacent and this is physically, as well as virtually, a switched connection. One is for the PU T2.1 link connection and the other for the PU T2.0 sessions. The first PU is for the physical connections to the network. Since the DLUR and DLUS are adjacent, the second PU is defined for the virtual or DLUR-DLUS connection.

Switched Major Node for the Physical Connection to CP31747

```

*****
*   SWITCHED MAJOR NODE FOR PHYSICAL SVC LINK TO CP31747   *
*****
SVC31747 VBUILD MAXGRP=1,                                X00010480
              MAXNO=1,                                    X
              TYPE=SWNET                                REQUIRED

**
*-----PU  DEFINITION FOR SVC CP31747      ----
**
SVC747PU PU  ADDR=C1,                                X00010540
              MAXDATA=521,                             X00010550
              DISCNT=NO,                                X00010570
              MAXOUT=7,                                 X00010580
              NETID=USIBMRA,                             X00010570
              CPNAME=CP31747,                             X
              CONNTYPE=APPN,                             X00010580
              MODETAB=AMODETAB,                         X00010580
              MAXPATH=2,                                 X00010590
              PACING=(7,1),                             X00010610
              VPACING=8,                                 X00010610
              PUTYPE=2,                                  X00010620
              PASSLIM=7,                                  X
              ISTATUS=ACTIVE
SVC747PA PATH PID=1,                                X00010830
              DIALNO=20100140030000,                   X00010850
              USE=YES                                INITIALLY ACTIVE

```

Figure 309. The X.25 SVC Switched Major Node for Physical Link to CP31747

Switched Major Node for the Virtual Connection to CP31747

```

*****
*   SWITCHED MAJOR NODE FOR VIRTUAL SVC LINK TO CP31747   *
*****
SVV31747 VBUILD MAXGRP=5,                                X00010480
              MAXNO=12,                                X00010490
              MAXDLUR=4,                                X00010490
              TYPE=SWNET                                REQUIRED
              REQUIRED                                00010500

**
SVV747PU PU  ADDR=C1,                                X00010540
              MAXDATA=521,                             X00010550
              DISCNT=NO,                                X00010570
              MAXOUT=7,                                 X00010580
              MODETAB=AMODETAB,                         X00010580
              IDBLK=017,                                 X
              IDNUM=31747,                               X
              MAXPATH=2,                                 X00010590
              PACING=(7,1),                             X00010610
              VPACING=8,                                 X00010610
              PUTYPE=2,                                  X00010620
              PASSLIM=7,                                  X
              ISTATUS=ACTIVE

**
SVV747PA PATH PID=1,DLURNAME=CP31747,                X00010830
              DLCADDR=(1,C,INTPU),                     X00010850
              DLCADDR=(2,X,01731747),                   X00010860
              USE=YES                                INITIALLY ACTIVE

*-----DLU DEFINITION -----
RA317472 LU  LOCADDR=2,DLOGMOD=DLUR,USSTAB=327X,ISTATUS=ACTIVE 00010650
RA317473 LU  LOCADDR=3,DLOGMOD=DLUR,USSTAB=327X,ISTATUS=ACTIVE 00010650

```

Figure 310. The X.25 SVC Switched Major Node for Virtual Link to CP31747

Since CP31741 is not adjacent to RAI (the DLUS), only the virtual switched connection is defined.

Switched Major Node Definition for Virtual Connection to CP31741

```

*****
*  DLUR / DLUS  VIRTUAL CONNECTION FOR NON-ADJACENT CP31741  *
*****
SW31741  VBUILD MAXGRP=5,          REQUIRED          X
              MAXNO=12,           REQUIRED          X
              MAXDLUR=2,          REQUIRED          X
              TYPE=SWNET          REQUIRED
**
*-----PU AND LU'S DEFINITION FOR CP31741 -----
**
SVC741PO PU  ADDR=C1,              COULD BE ANYTHING (NOT USED)  X
              MAXDATA=521,          X
              DISCNT=NO,            X
              MAXOUT=7,             X
              MODETAB=AMODETAB,     X
              IDBLK=017,            X
              IDNUM=31741,          X
              MAXPATH=2,            X
              PACING=(7,1),         X
              VPACING=8,            X
              PUTYPE=2,             X
              PASSLIM=7,            X
              ISTATUS=ACTIVE
SVC741PA PATH DLCADDR=(1,C,INTPU),DLCADDR=(2,X,01731741),    X
              DLURNAME=CP31741,    X
              PID=1,                X
              USE=YES              INITIALLY ACTIVE
*-----DLU DEFINITION -----
RA317412 LU  LOCADDR=02,MODETAB=AMODETAB,USSTAB=US327X,      X
              DLOGMOD=DLUR,ISTATUS=ACTIVE
RA317413 LU  LOCADDR=03,MODETAB=AMODETAB,USSTAB=US327X,      X
              DLOGMOD=DLUR,ISTATUS=ACTIVE

```

Figure 311. The X.25 SVC Switched Major Node Definition for CP31741

17.7 AS/400 Definitions for RALYAS4B

X.25 Line and Controller Definition for the 3174-11R

Display Line Description		RALYAS4B
Line description	MANNY	
Option	*BASIC	
Category of line	*X25	
Resource name	LIN051	
Local network address	201001209	1
Extended network addressing	*NO	
Connection initiation	*WAIT	
Online at IPL	*YES	
Physical interface	*X21BISV24	
Connection type	*NONSWTPP	2
X.25 DCE support	*NO	
Vary on wait	*NOWAIT	
Line speed	9600	
Logical channel entries:		3
Logical channel identifier	001	
Logical channel type	*SVCBOTH	
Logical channel identifier	002	
Logical channel type	*SVCBOTH	
Exchange identifier	05615533	
Maximum frame size	1024	
Default packet size:		
Transmit value	128	4
Receive value	*TRANSMIT	
Maximum packet size:		
Transmit value	*DFTPKTSIZE	
Receive value	*TRANSMIT	
Modulus	8	4
Default window size:		
Transmit value	7	4
Receive value	*TRANSMIT	
Insert net address in packets	*YES	
Error threshold level	*OFF	
Modem type supported	*NORMAL	
Switched connection type	*DIAL	
Autoanswer type	*DTR	
Text	*BLANK	

Display Controller Description		
Controller description	MRDU	
Option	*BASIC	
Category of controller	*APPC	7
Link type	*X25	
X.25 network level	1984	4
X.25 link level protocol	*QLLC	4
Online at IPL	*YES	
Switched connection	*YES	
Active switched line	MANNY	
Character code	*EBCDIC	
Maximum frame size	1033	
Remote network identifier	USIBMRA	7
Remote control point	CP31747	7
APPN CP session support	*YES	7
APPN node type	*NETNODE	7
Initial connection	*ANS	5
Connection number	201001400	6
Active X.25 network address	201001400	
Answer number	*CNNNBR	
Controller description	MRDU	
Option	*BASIC	
Category of controller	*APPC	7
Switch disconnect	*YES	
Data link role	*NEG	
Text	*BLANK	

Figure 312. Line and Controller Definition for the AS/400

1 This figure shows the line and controller definitions of RALYAS4B as connected in an SVC environment. Important notes to be considered are the following:

1 Also known as DTE address. It should match the DTE address for RALYAS4A in the 3174 network resource.

2 To specify that this is a SVC environment.

3 The logical to be used in an SVC environment. There are eight logical channels given for the AS/400 by the network supplier.

4 These are critical X.25 parameters that should also match the equivalent in 3174 (as defined in the network by the supplier).

5 The AS/400 will wait for the 3174 to initiate the call after a device vary on.

6 The DTE address for the 3174.

7 APPN supporting parameters for 3174.

There is no device description created. The AS/400 automatically creates them when a remote device requests for an APPC session.

Token-Ring Line and Controller Definition for RALYASA

Display Line Description		RALYAS4B
Line description	L31TR	
Option	*BASIC	
Category of line	*TRLAN	
Resource name	LIN031	
Online at IPL	*YES	
Vary on wait	*NOWAIT	
Network controller	L31TRNET	
Maximum controllers	256	
Line speed	4M	
Maximum frame size	1994	
TRLAN manager logging level	*OFF	
Current logging level	*OFF	
TRLAN manager mode	*OBSERVING	
Log configuration changes	*LOG	
Token-Ring inform of beacon	*YES	
Local adapter address	400010020002	
Exchange identifier	05615533	
Error threshold level	*OFF	
Text	Token-ring line on Lin031 / 4 M	

Display Controller Description		RALYAS4B
Controller description	RALYAS4A	
Option	*BASIC	
Category of controller	*APPC	
Link type	*LAN	
Online at IPL	*YES	
Active switched line	L31TR	
Character code	*EBCDIC	
Maximum frame size	16393	
Remote network identifier	*NETATR	
Remote control point	RALYAS4A	
Initial connection	*DIAL	
Dial initiation	*LINKTYPE	
Switched disconnect	*YES	
Data link role	*NEG	
LAN remote adapter address	400010020001	
LAN DSAP	04	
LAN SSAP	04	

Figure 313. The Token-Ring Line and Controller Definition for RALYAS4A

17.8 PS/2 Customization

We have only shown the definition for the PS/2 running CM/2 1.11 for 3270 and 5250 emulation. The PS/2 running Personal Communications AS/400 and 3270 Version 4.0 for Windows customization is not shown.

```
DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.WTR42992)
                  CP_ALIAS(5250LU)
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN)
                  NODE_ID(X'05D42992')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(LINK0001)
                   ADJACENT_NODE_TYPE(NN)
                   PREFERRED_NN_SERVER(YES)
                   DLC_NAME(ETHERAND)
                   ADAPTER_NUMBER(0)
                   DESTINATION_ADDRESS(X'400031740007')
                   ETHERNET_FORMAT(NO)
                   CP_CP_SESSION_SUPPORT(YES)
                   SOLICIT_SSCP_SESSION(NO)
                   NODE_ID(X'05D42992')
                   ACTIVATE_AT_STARTUP(YES)
                   USE_PUNAME_AS_CPNAME(NO)
                   LIMITED_RESOURCE(USE_ADAPTER_DEFINITION)
                   LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                   MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                   EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                   COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                   COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                   SECURITY(USE_ADAPTER_DEFINITION)
                   PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_PARTNER_LU  FQ_PARTNER_LU_NAME(USIBMRA.RALYAS4B)
                   PARTNER_LU_ALIAS(5250PLU)
                   MAX_MC_LL_SEND_SIZE(32767)
                   CONV_SECURITY_VERIFICATION(NO)
                   PARALLEL_SESSION_SUPPORT(YES);

DEFINE_MODE  MODE_NAME(QPCSUPP)
             COS_NAME(#CONNECT)
             DEFAULT_RU_SIZE(NO)
             MAX_RU_SIZE_UPPER_BOUND(1024)
             RECEIVE_PACING_WINDOW(7)
             MAX_NEGOTIABLE_SESSION_LIMIT(32767)
             PLU_MODE_SESSION_LIMIT(64)
             MIN_CONWINNERS_SOURCE(32)
             COMPRESSION_NEED(PROHIBITED)
             PLU_SLU_COMPRESSION(NONE)
             SLU_PLU_COMPRESSION(NONE);

DEFINE_DEFAULTS  IMPLICIT_INBOUND_PLU_SUPPORT(YES)
                 DEFAULT_MODE_NAME(BLANK)
                 MAX_MC_LL_SEND_SIZE(32767)
                 DIRECTORY_FOR_INBOUND_ATTACHES(*)
                 DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
                 DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
                 DEFAULT_TP_CONV_SECURITY_RQD(NO)
                 MAX_HELD_ALERTS(10);

START_ATTACH_MANAGER;
```

Figure 314. PS/2 WTR42992 NDF File

17.9 Verification for the 3174

DLUR Connectivity for Port 0, HG 26 for 3174-11R


```

_____ DLUR Connectivity for PN 01, HG 26 _____

Adapter HG status:      Enabled
Port PN status:        Powered on
Device type:           Video display MLT

Current connectivity-

      LT   LU Name   DLUS CPNAME   PLU CPNAME   PLU-SLU Link ID
      1    RA317473  USIBMRA.RAI   USIBMRA.RAI         4
      2                                USIBMRA.RAI   Not active
      3                                USIBMRA.RAI   Not active
      4                                USIBMRA.RAI   Not active
      5                                USIBMRA.RAI   Not active

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  12=Test Menu

```

Figure 315. DLUR Connectivity for 3174-11R

3270 Host Status for 3174-11R X.25 Link

```

_____ 3270 Host Status Summary _____

ID   Host Descriptor   HG   Attach   Connection
                        Status

1A   DLUS host         11   X.25     500-01 Up

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  5=Refresh  12=Test Menu

```

Figure 316. 3270 Host Status for X.25 Link

Adjacent Nodes to 3174-11R

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
-----	-----	-----	----	-----	-----	-----	-----
1 1	USIBMRA	RA5250	LN	OPEN	08	0	NA
2 2	USIBMRA	RALYAS4B	NN	OPEN	08	2	YES
2 3	USIBMRA	CP31741	NN	OPEN	08	3	YES
2 4	USIBMRA	RAI	NN	OPEN	08	6	YES
3 5	USIBMRA	WTR42992	EN	OPEN	08	1	YES

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4729-Enter the LINKID to run Link Status Test
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 317. Adjacent Nodes

The adjacent nodes included **1** a LEN node, **2** three NNs, and **3** an EN. The sessions are detailed in the Local LU 6.2 Session Status display shown in Figure 318.

Local LU6.2 Sessions Status

Local LU 6.2 Session Status							
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU	
-----	-----	-----	-----	--	-----	-----	
EE4B76FF000000E4	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	RAI	
F86FE164B29EF91E	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI	
EE4B76FF00000003	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	CP31741	
EE4B7AFF3A1714DB	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31741	
F86FE164B29EF923	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI	
EE4B76FF000000E6	USIBMRA	CP31747	ACTIVE	02	CPSVRMGR	RAI	
EE4B76FF000000E7	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	RALYAS4B	
F64B0D2ECBA21104	USIBMRA	RALYAS4B	ACTIVE	02	CPSVCMG	RALYAS4B	
F64B0D2ECBA21105	USIBMRA	RALYAS4B	ACTIVE	02	SNASVCMG	RALYAS4B	
EE4B76FF000000E8	USIBMRA	CP31747	ACTIVE	02	SNASVCMG	RALYAS4B	
EE4B76FF0000001E	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	WTR42992	
E23FC25B606BA882	USIBMRA	WTR42992	ACTIVE	02	CPSVCMG	WTR42992	

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 318. Local LU6.2 Sessions Status

Active Locate Requests

Active Locate Requests				
FQPCID	N	RCVD From	Out	LUNAME
-----	-	-----	---	-----
F1C370EFB7B195C5.NETBL04.CDRM4 1	2 23	USIBMRA 3 RAI	4 1	5 USIBMRA RAON8

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 319. Activate Locate Requests

Test 17 Option 6 displays information on all of the locate requests currently active in the 3174 NN. Up to 15 locates can be displayed on each panel.

- 1** The Fully Qualified Procedure Correlator Identifier (FQPCID) is an identification assigned by the originating node to the locate request.
- 2** N is a sequence number assigned to the Locate request by the 3174.
- 3** The NETID and CPNAME of the node that sent the Locate request. This will be blank if it is the 3174 itself.
- 4** Out shows the number of outstanding requests against the specified locate.
- 5** The NETID and LUNAME of the LU being located.

DLUR connectivity for 3174-14R

DLUR Connectivity for PN 00, HG 26				
Adapter HG status: Enabled				
Port PN status: Powered on				
Device type: Video display CUT				
Current connectivity-				
LT	LU Name	DLUS CPNAME	PLU CPNAME	PLU-SLU Link ID
1	S3174102	USIBMRA.RAI	USIBMRA.RAI	2

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 12=Test Menu

Figure 320. DLUR Connectivity for 3174-14R

3270 Host Status 3174-14R

3270 Host Status Summary				
ID	Host Descriptor	HG	Attach	Connection Status
1A	DLUS host	41	Ethernet	500-01 Up
To go directly to other tests, enter: /Test,Option Select Test; press ENTER ==>				
PF: 3=Quit 5=Refresh 12=Test Menu				

Figure 321. 3270 Host Status for 3174-14R

Adjacent Nodes 3174-14R

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
2	USIBMRA	CP31747	NN	OPEN	08	2	YES
10	USIBMRA	PCOM5250	EN	OPEN	08	0	NO
To go directly to other tests, enter: /Test,Option Select Option; press ENTER ==> 4729-Enter the LINKID to run Link Status Test PF: 3=Quit 5=Refresh 12=Test Menu							

Figure 322. Adjacent Nodes for 3174-14R

Activate Locate Requests Panel

Active Locate Requests				
FQPCID	N	RCVD From	Out	LUNAME
No active Locate Requests exist				
To go directly to other tests, enter: /Test,Option Select Option; press ENTER ==>				
PF: 3=Quit 5=Refresh 12=Test Menu				

Figure 323. No Active Locate Request for 3174-14R

Local LU6.2 Session Status

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
-----	-----	-----	-----	--	-----	-----
EE4B7AFF3A1714DB	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31747
EE4B76FF00000003	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	CP31747
To go directly to other tests, enter: /Test,Option						
Select Option; press ENTER ==>						
PF: 3=Quit 5=Refresh 12=Test Menu						

Figure 324. Local LU6.2 Session Status

17.10 APPN over X.25 PVC and SVC Concurrently

All definitions from the SVC scenario remain the same with the exceptions shown in the next session.

17.10.1 X.25 Circuit Definitions

Circuit Definitions for Host Link

332: X.25 Options			
400 - 00 1 0	1 401 - 1	2 402 - 0001	
409 - 10100100	3 420 - 00000000	4 421 - 00000000	
423 -		424 - 201001400	
430 - 1	431 - 0	432 - 07	433 - 7
434 - 1	435 - 07		
440 - A	441 -	442 -	
450 - 0300	451 - 10	452 -	453 - 10000000
461 -	462 -	5 463 - 0002	464 - 0008
465 -	466 -		
Select Test; press ENTER ==>			
PF: 3=Quit 7=Back 8=Fwd 12=Test Menu			

Figure 325. X.25 Circuit Definitions for Host Link

1 A 1 response indicates this is to be a PVC.

2 This is the logical channel number (LCN).

We no longer specify that the calling DTE address will be validated, **3**, or that the 3174 address will be supplied in the call request packet, **4**.

5 Logical Channel 0001 is now assigned for the PVC. Our lowest two-way channel is now 0002.

17.10.2 WAN Profiles

X.25 Circuit Profiles for Adjacent Nodes

X.25 Circuit Profiles

1	401 - 4		421 - 10000000	
	420 - 10000000		432 - 07	
	430 - 1		441 - __	442 - ____
	440 - A			
	453 - 10000000			
2	401 - 4		421 - 00000000	
	420 - 10000000		432 - 07	
	430 - 1		441 - __	442 - ____
	440 - A			
	453 - 10000000			
Select Test; press ENTER ==>				
PF: 3=Quit 8=Fwd 12=Test Menu				

Figure 326. X.25 Circuit Profiles to Adjacent Nodes

17.10.3 Defining 3174 APPN Resources

Local APPN Resource Definitions

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 4
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point 614-615
614 FP NAME - RALYAS4A      615 FP NETID - USIBMRA_

Report to Alert Focal Point 616
616 HOST LINKS - _ _ _ _ _

DLUS Primary Host Name 620-621
620 CPNAME - RAI_____ 621 NETID - USIBMRA_

DLUS Backup Host Name 622-623
622 CPNAME - _____ 623 NETID - _____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 327. APPN Node Definition

X.25 APPN Node Connect Definition

```

_____ X.25 APPN Nodes _____

CPNAME    PROFILE  CONNECTION  LCN    DTE ADDR
              ID
1 1 RALYAS4B    01      _____  _____ 201001209_____
2 2 RAI        1A      _____  0001      _____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 328. X.25 APPN Nodes

- 1** The connection to RALYAS4A is still on an SVC.
- 2** This time we use a Permanent Virtual Circuit to RAI. Consequently, the LCN (Logical Channel Number) has to be identified. The total number of channels and PVCs cannot exceed 255.

17.11 NCP Definition for PVC Connection

The NCP source used in the SVC scenario is also used for this one. Instead of using one of the eighteen logical channels for the SVC connection, the connection is made directly to the PVC defined below. Parameter **1** XID=YES is specified to allow a PU T2.1 session flow in this link.

```
*****
*          PVC FOR 3174 VIA X25NET
*****
L08X01  X25.LINE TYPE=P,          1. PERMANENT VC          *
          COMMITO=4,              *
          DSTNODE=BNN,            *
          ISTATUS=ACTIVE,         *
          LCN=1,                  *
          LLC=LLC3,               *
          NCPGRP=G08X2,          *
          VCCINDX=1               *
P08X01A X25.PU PUTYPE=2,          *
          ADDR=C1,                *
          MAXDATA=265,            *
          1 XID=YES,                *
          MAXOUT=7                *
T08X01A1 X25.LU LOCADDR=2
T08X01A2 X25.LU LOCADDR=3
```

Figure 329. The X.25 PVC NCP Definition

17.12 VTAM Definition for PVC Connection

```
*****
*          DLUR / DLUS X.25 PVC Definition
*****
SW31P2  VBUILD MAXGRP=5,          REQUIRED
          MAXNO=12,               REQUIRED
          MAXDLUR=2,              REQUIRED
          TYPE=SWNET              REQUIRED

**
*-----PU AND LU'S -----
**
SW31P2PU PU  ADDR=C1,
          MAXDATA=521,
          DISCNT=NO,
          MAXOUT=7,
          MODETAB=AMODETAB,
          IDBLK=017,
          IDNUM=31747,
          MAXPATH=2,
          PACING=(7,1),
          VPACING=8,
          PUTYPE=2,
          PASSLIM=7,
          ISTATUS=ACTIVE
SW31P2  PATH  DLCADDR=(1,C,INTPU),DLCADDR=(2,X,01731747),
          DLURNAME=CP31747,
          PID=1,
          USE=YES                  INITIALLY ACTIVE
*-----DLU DEFINITION -----
LU1P20  LU  LOCADDR=2,DLOGMOD=DLUR,LOGAPPL=RAIAN
LU2P20  LU  LOCADDR=3,DLOGMOD=DLUR,LOGAPPL=CICS18
```

Figure 330. The VTAM Switch Major Node for a PVC DLUR/DLUS Connection

In a PVC environment, only one switched major node is required. This is unlike an SVC where you have to define two switched major nodes: one for the physical connection and PU T2.1 sessions and one for the virtual connection and PU T2.0 sessions. The LINE/PU definitions in the NCP are used for the physical connections and PU T2.1 sessions.

17.13 Verification from the 3174 Perspective

DLUR Connectivity for 3174-11R with PVC

```
_____ DLUR Connectivity for PN 00, HG 26 _____

Adapter HG status:      Enabled
Port PN status:        Powered on
Device type:           Video display CUT

Current connectivity-

      LT   LU Name   DLUS CPNAME      PLU CPNAME      PLU-SLU Link ID
      --   -
      1   LU1P20    USIBMRA.RAI      USIBMRA.RAI      4

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF:  3=Quit  12=Test Menu
```

Figure 331. DLUR Connectivity for Port 0, HG 26

Nodes Adjacent to 3174-11R

```
_____ Adjacent Nodes _____

LINKID  NETID    CPNAME   Type   Status  State  Num Sess  CP-CP
-----  -
      1  USIBMRA  RA5250   LN    CLOSED   01       0      NA
      2  USIBMRA  RALYAS4B NN     OPEN    08       3     YES
      3  USIBMRA  CP31741 NN     OPEN    08       3     YES
      4  USIBMRA   RAI      NN     OPEN    08       5     YES
      5  USIBMRA  WTR42992 EN     OPEN    08       1     YES

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test
PF:  3=Quit  5=Refresh  12=Test Menu
```

Figure 332. Adjacent Node Display for CP31747

Local LU 6.2 Session Status for 3174-11R

Local LU 6.2 Session Status							
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU	
-----	-----	-----	-----	--	-----	-----	
EE4B76FF3BA5B0F4	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	CP31741	
EE4B7AFF3A1715D6	USIBMRA	CP31741	ACTIVE	02	CPSVCMG	CP31741	
EE4B76FF3BA5B0F5	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	WTR42992	
E23FC25B9D6BA882	USIBMRA	WTR42992	ACTIVE	02	CPSVCMG	WTR42992	
EE4B76FF3BA5B0F7	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	RALYAS4B	
F64B0D2ECBA211EC	USIBMRA	RALYAS4B	ACTIVE	02	CPSVCMG	RALYAS4B	
EE4B76FF3BA5B0F8	USIBMRA	CP31747	ACTIVE	02	CPSVCMG	RAI	
F86FE164B29EFE17	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI	
F64B0D2ECBA211F1	USIBMRA	RALYAS4B	ACTIVE	02	SNASVCMG	RALYAS4B	
EE4B76FF3BA5B0F9	USIBMRA	CP31747	ACTIVE	02	SNASVCMG	RALYAS4B	
F86FE164B29EFFC4	USIBMRA	RAI	ACTIVE	02	CPSVRMGR	RAI	
EE4B76FF3BA5B0FC	USIBMRA	CP31747	ACTIVE	02	CPSVRMGR	RAI	

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 333. CP31747 Local LU 6.2 Session Status

17.14 Verification from a Host Perspective

NetView Display of the PU on the PVC Line

```

NCCF                      N E T V I E W      RAIAN DUCUT      09/15/94 20:5
C RAIAN      DISPLAY NET,ID=P08X01A,SCOPE=ALL
      RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST075I NAME = P08X01A              , TYPE = PU_T2.1
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = CP31747 , CP NETID = USIBMRA , DYNAMIC LU = YES
IST1105I RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I P08X01A AC/R      21 YES  982D0000000000000000000017100808080
IST081I  LINE NAME = L08X01 , LINE GROUP = G08X2 , MAJNOD = RA8NCKH
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST355I LOGICAL UNITS:
IST080I T08X01A1 NEVAC      T08X01A2 NEVAC      T08X01A3 NEVAC
IST080I CP31747 ACT/S-----Y CP31741 ACT/S-----Y LU1P20 ACT/S
IST080I LU2P20 ACT/S      S3174102 ACT/S
IST314I END

```

Figure 334. NetView Display of P08X01A

Figure 334 shows P08X01A being used as a PU T2.1 link with LU-LU sessions flowing such as the CP-CP and CPSVRMGR sessions.

NetView Display of the Switched Major Node

```

C RAIAN      DISPLAY NET,ID=SW3174P2,SCOPE=ALL
  RAIAN      IST097I  DISPLAY  ACCEPTED
'  RAIAN
IST075I NAME = SW3174P2          , TYPE = SW SNA MAJ NODE
IST486I STATUS=  ACTIV          , DESIRED STATE=  ACTIV
IST084I NETWORK NODES:
IST089I SW31P2PU TYPE = PHYSICAL UNIT      , ACTIV
IST089I LU1P20  TYPE = LOGICAL UNIT        , ACT/S
IST089I LU2P20  TYPE = LOGICAL UNIT        , ACT/S
IST314I END

```

Figure 335. VTAM Switched Major Node SW3174P2 Status

Figure 335 shows switch major node SW3174P2 with PU being active and LUs in session.

NLDM Session Configuration

NLDM.CON		SESSION CONFIGURATION DATA				PA
PRIMARY		SECONDARY				
NAME CP31747	SA 00000008 EL 0390	NAME RAI	SA 00000012	E		
DOMAIN RAIAN	PCID USIBMRA.CP31747.EE4B76FF3BA5B0FC				DOMAIN	
RA8NCKH (0000)	SUBAREA PU	APPN TP 03	CP/SSCP	RAI	ISTPUS1	
		SUBA TP 00	SUBAREA PU			
		VR 00				
L08X01	LINK	ER 05			RAI	
		RER 00	LU			
		APPNCOS SNASVCMG				
P08X01A (0024)	PU	LOGMODE CPSVRMGR				
		PADJ CP CP31747				
CP31747 (0390)	ILU					

Figure 336. NLDM Session Display

Figure 336 shows an NLDM session display of a CPSVRMGR session between CP31747 and RAI as it flows through P08X01A.

NLDM.CON		SESSION CONFIGURATION DATA				PAG
PRIMARY		SECONDARY				
NAME RAIAN005	SA 00000012 EL 0011	NAME LU1P20	SA 00000008	EL		
DOMAIN RAIAN	PCID USIBMRA.RAI.F86FE164B29F00D5				DOMAIN	
RAI ISTPUS18(0000)	CP/SSCP SUBAREA PU	APPN TP 01			RA8NCKH	
		SUBA TP 00	SUBAREA PU			
		VR 00				
RAIAN005(0011)	LU	ER 00			L08X01	
		RER 05	LINK			
		APPNCOS #CONNECT				
		LOGMODE DLUR	PU	P08X01A		
		SADJ CP CP31747				
			ILU	LU1P20		

Figure 337. The Verify Screens for PVC Connection of CP31747 to RAI

This shows the LU-LU sessions indeed flow in a PU 2.1 link which indicates the DLUS/DLUR taking advantage of APPN routing.

Chapter 18. APPN over 3174 ESCON Channel Connection

In this scenario we use Configuration Support-C Release 6 to show how to set up an SLMH connection to two hosts connected by an ESCON director. In our example we will set up and configure to two hosts for APPN. Up to eight hosts can be configured, if desired with Configuration Support-C Release 6.

18.1 Configuration

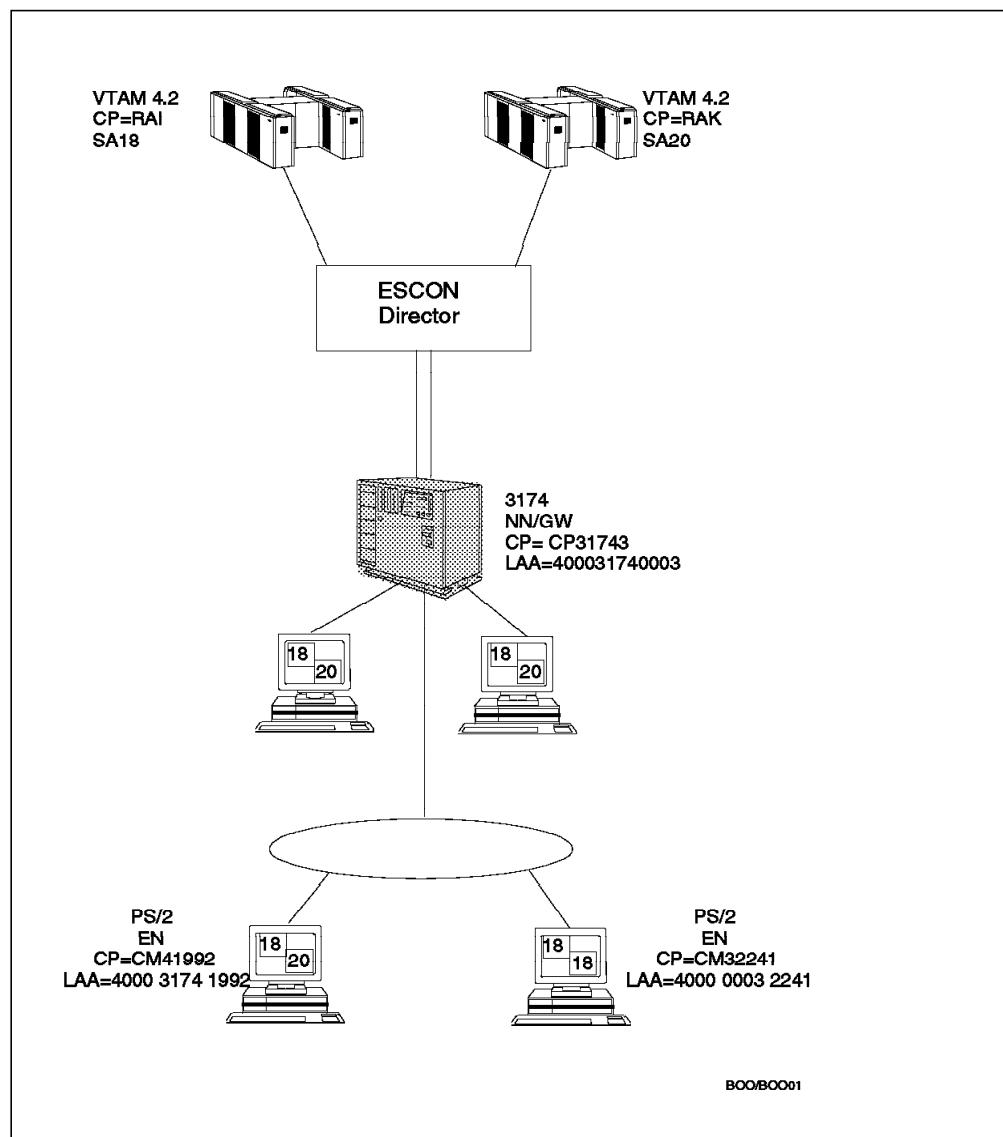


Figure 338. Scenario Configuration

18.2 Definition Overview

This scenario also configures the LTA (Logical Terminal Assignment table) so that on a CUT terminal we are able to jump from one host to another host. In this case if we were to lose a host or link we would still have 3270 sessions.

One PC CM41992 is configured as an end node and to use two different hosts for 3270 sessions.

Another PC CM32241 is also an EN with 3270 sessions to Host 1A.

The composite network has the following components:

- Two S/370 host with VTAM V4.R2
 - One ICN with CP name RAI and subarea SA18
 - Another ICN with CP name RAK and subarea SA20
- 9032 ESCON Director
- 3174-12L (CP31743)
 - APPN NN
 - Token-ring gateway (400031740003)
- PS/2 EN (CM41992)
 - End node
 - Multi-Host via SAPs
 - Token-ring address (400031741992)
- PS/2 EN (CM32241)
 - End node
 - Token-ring address (400000032241)

In our configuration, the 3174 model 12L supports PU2.0, LAN Gateway (GW) and APPN functions all in the same box, using Configuration Support-C Release 6.

In this setup, the following 3174 services are available:

- CUT terminals can access multiple hosts (SLMH).
- DSPUs on the LAN can also access multiple hosts.
- 3174 APPN function enables APPN or LEN nodes, which are Peer- or LAN-attached, to reach Client/Server applications in an upstream VTAM or any other node in the APPN network.

18.3 3174-12L Customization

In the 3174-12L customization, we do the following:

- Enable the 3174-12L APPN function on both hosts
- Specify the 3174-12L network ID and control point name
- Set up the LTA (Logical Terminal Assignment table)
- Configure PC for APPN and multi-host 3270 sessions

3174 Model / Attachment Panel

```

_____ Model / Attach _____

Online Test Password    098 -

Product Assistance Data
099 -

3174 Model             1 100 - 12L

Host Attachment         2 101 - M  (1-BSC           6-SDLC, X.21 Switched
                                   2-SDLC           7-Token-Ring
                                   3-X.25           8-Ethernet
                                   4-Non-SNA Channel 9-Frame Relay
                                   5-SNA Channel    M-Multi-host)

LAN adapter type        3 102 - 1  (0-none
                                   1-Token-Ring
                                   2-Ethernet)

NSO selection           103 - 0000000000000000
Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu

```

Figure 339. Defining the 3174 SLMH over the ESCON Link

1 This is the ESCON model to be configured.

2 The link to the host is an SLMH via ESCON.

3 The LAN adapter type is token-ring.

Token-Ring Description

```

_____ Token-Ring Description _____

Token-Ring Address      080 - 4000 3174 0003

Token-Ring Speed        082 - 0  (0- 4Mbps
                                   1-16Mbps
                                   2-16Mbps with early Token Release)

Select Test; press ENTER ==>

PF:  3=Quit  7=Back 8=Fwd 12=Test Menu

```

Figure 340. Defining the Token-Ring

Multi-Host Definition Panel

```

Multi-Host Definition

Select _ Host ID and press ENTER

Host ID   Adapter Type   Host Attach   Hardware Group   Include in IML   Host Descriptor

1A 1      -                5 2          -                -                SY18_____
2A        -                -              -                -                _____
3A        -                -              -                -                _____
1B 3      -                -              -                1                SY20_____
-         -                -              -                -                _____
-         -                -              -                -                _____
-         -                -              -                -                _____
-         -                -              -                -                _____
-         -                -              -                -                _____
-         -                -              -                -                _____
-         -                -              -                -                _____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 341. Multi-Host panel

- 1** 1A is the primary host for the SNA channel.
- 2** In this example the host attachment is via the ESCON director.
- 3** 1B also uses the same link to the director.

18.3.1 Configuring the 3174 Host Attachment for host 1A

```

Local (SNA)
1A = SY18

104 - 60 1    105 - 63 2    108 - 1234567    110 - 1 0000    116 - 1_ __
121 - 01      123 - 0      125 - 00000100    126 - 00000000    127 - 0 0
132 - 0 0 0 0    136 - 1 1 1 1    137 - 0 0 0 0    138 - 0
141 - A          150 - 1 0 3    165 - 0          166 - A          168 - 1
172 - 0          173 - 00000000    175 -          179 - 0 0 0    190 - 00
213 - 1          215 - 00000    220 - 0

240 - 0 4      241 - 0          242 - 1 5

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 342. Customizing the 3174-12L for a Local Token-Ring Gateway

- 1** Question 104 specifies the channel address of the 3174-12L as defined in VTAM. For our 3174-12L gateway we use a channel address of 60 to get to the first host on 1A.

2 Question 105 defines the upper limit poll address for DSPUs. In our example the CPNAME CM32241 is address 061 and the CPNAME CM41992 is address 062 from this system.

3 Question 150=1 0 enables the token-ring gateway function for DSPUs. Since we are using Configuration Support-C Release 6 , we customize the 3174-12L as a gateway so that we can use the PCs on the ring as APPN end nodes.

4 Question 240 is the CUADDR we are using in the ESCON director to get to the host. This address is from the IOCP generation.

5 Question 242 allows this link to carry T2.0 and T2.1 traffic; it is required for APPN support.

Common SNA

```

      _____ Common SNA _____
              1A = SY18

500 - 0          501 - USIBMRA 1 502 - CP31743

APPN Support Fields:

510 - 1 2          511 - CP31743 3 512 - VN31743

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 343. Names to Identify the 3174-12L Network Node

1 The 3174-12L is customized as being in network ID USIBMRA.

2 Question 510=1 enables APPN functions.

3 Question 511 specifies the control point name used for the 3174-12L; this name *must* be unique in the network.

Common Network

```

      _____ Common Network _____
              1A = SY18

900 - 4000 3174 0003 04 1 905 - 1          908 - 31743

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 344. Token-Ring Definition for the 3174-12L

1 Question 900 specifies the token-ring address of the 3174-12L. For the first host we use SAP 04. This is important as this is how the 3270 sessions know what host to go to. You will see later on for Host 1B we use a different SAP.

Configuring the LAN Attachments

```

          940: LAN Address Assignment
          1A = SY18

S      LAN Address      SAP      T      S      LAN Address      SAP      T
60     4000 3174 0003    1 04
61     4000 0003 2241    2 04      0      62     4000 3174 1992    3 04      0
63     4000 0000 0063      04      0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 345. Ring Address Assignments

- 1** LAA address of the token-ring card in the 3174-12L
- 2** LAA address of the PS/2 with CPNAME CM32241
- 3** LAA address of the PS/2 with CPNAME CM41992

Port Assignment Table for Host 1A

```

          117: Port Assignment
          1A = SY18

Host addresses
Port IS 1 2 3 4 5
26-00 2 002 006 1
26-02 2 004 008
26-04 0
26-06 0
26-08 0
26-10 0
26-12 0
26-14 0
26-16 0
26-18 0
26-20 0
26-22 0
26-24 0
26-26 0
26-28 0
26-30 0

Host addresses
Port IS 1 2 3 4 5
26-01 2 003 007
26-03 2 005 009
26-05 0
26-07 0
26-09 0
26-11 0
26-13 0
26-15 0
26-17 0
26-19 0
26-21 0
26-23 0
26-25 0
26-27 0
26-29 0
26-31 0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 346. LU Port Assignment Table

- 1** Here we assign the LUs to port 1 to 4 for Host 1A; later in the LTA table we assign them to the terminal.

18.3.2 Configuring the 3174 Host Attachment for host 1B

```

_____ Local (SNA) _____
      1B = SY20

104 - 80 1    105 - 83 2                                116 - 1_ _
121 - 01                                125 - 00*****0        127 - 0 0

                                150 - 1 0 3    165 - 0
                                179 - 0 0 0    190 - 00
                                215 - 00000    220 - 0        221 - 0

240 - 7 4                                242 - 1 5

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu
```

Figure 347. Customizing the 3174-12L for a Second Local Token-Ring Gateway

1 Question 104 specifies the channel address of the 3174-12L as defined in VTAM. For our 3174-12L gateway we use a channel address of 80 to get to the other Host 1B.

2 Question 105 defines the upper limit poll address for DSPUs. In our example the CPNAME CM41992 is address 081 and the CPNAME CM32241 is address 082 from this system.

3 Question 150=1 0 enables the token-ring gateway function for DSPUs. Since we are using Configuration Support-C Release 6, we customize the 3174-12L as a gateway so that we can use the PCs on the ring as APPN end nodes.

4 Question 240 is the CUADDR we use in the ESCON director to get to the host. This address is from the IOCP generation.

5 Question 242 allows this link to carry T2.0 and T2.1 traffic; it is required for APPN support (Q510= 1).

Common SNA

```

_____ Common Network _____
          1B = SY20

900 - 4000 3174 0003 08 1 905 - 1          908 - 31743

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 348. Common SNA

1 Question 900 specifies the token-ring address of the 3174-12L. For the first host we use SAP 04. For Host 1B we specify a SAP of 08; this is done because we only have one token-ring card in the PC. When the PC is configured for SNA sessions, we configure two host attachments (one uses SAP 04 to get to RAI, and the other uses SAP 08 to get to RAK).

Configuring the LAN attachments for HOST 1B

```

_____ 940: LAN Address Assignment _____
          1B = SY20

S      LAN Address  SAP  T      S      LAN Address  SAP  T
80     4000 3174 0003 1 08      82     4000 0003 2241 3 04  0
81     4000 3174 1992 2 04  0      83     4000 0000 0063  04  0
83     4000 0000 0063  04  0

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

```

Figure 349. Ring Address Assignments

1 This is the address of the token-ring card in the 3174-12L. We use SAP 08 for its link to Host 1B.

2 This is the LAA address of the PS/2 with CPNAME CM41992.

3 This is the LAA address of the PS/2 with CPNAME CM32241.

Port Assignment Table for Host 1B

```

_____ 117: Port Assignment _____
1B = SY20

      Host addresses
Port  IS  1  2  3  4  5
26-00 2 002 006  ___  ___  ___
26-02 2 004 008  ___  ___  ___
26-04 0      ___  ___  ___  ___
26-06 0      ___  ___  ___  ___
26-08 0      ___  ___  ___  ___
26-10 0      ___  ___  ___  ___
26-12 0      ___  ___  ___  ___
26-14 0      ___  ___  ___  ___
26-16 0      ___  ___  ___  ___
26-18 0      ___  ___  ___  ___
26-20 0      ___  ___  ___  ___
26-22 0      ___  ___  ___  ___
26-24 0      ___  ___  ___  ___
26-26 0      ___  ___  ___  ___
26-28 0      ___  ___  ___  ___
26-30 0      ___  ___  ___  ___

      Host addresses
Port  IS  1  2  3  4  5
26-01 2 003 007  ___  ___  ___
26-03 2 005 009  ___  ___  ___
26-05 0      ___  ___  ___  ___
26-07 0      ___  ___  ___  ___
26-09 0      ___  ___  ___  ___
26-11 0      ___  ___  ___  ___
26-13 0      ___  ___  ___  ___
26-15 0      ___  ___  ___  ___
26-17 0      ___  ___  ___  ___
26-19 0      ___  ___  ___  ___
26-21 0      ___  ___  ___  ___
26-23 0      ___  ___  ___  ___
26-25 0      ___  ___  ___  ___
26-27 0      ___  ___  ___  ___
26-29 0      ___  ___  ___  ___
26-31 0      ___  ___  ___  ___

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd  12=Test Menu

```

Figure 350. Post Assignment Table for Host 1B

18.3.3 Common 3174 Customization

Logical Terminal Assignment											
801=2											
Port LT1 LT2 LT3 LT4 LT5						Port LT1 LT2 LT3 LT4 LT5					
26-00	1A1	1B1	1A2	1B2	___	26-01	1A1	1B1	1A2	1B2	___
26-02	1A1	1B1	1A2	1B2	___	26-03	1A1	1B1	1A2	1B2	___
26-04	___	___	___	___	___	26-05	___	___	___	___	___
26-06	___	___	___	___	___	26-07	___	___	___	___	___
26-08	___	___	___	___	___	26-09	___	___	___	___	___
26-10	___	___	___	___	___	26-11	___	___	___	___	___
26-12	___	___	___	___	___	26-13	___	___	___	___	___
26-14	___	___	___	___	___	26-15	___	___	___	___	___
26-16	___	___	___	___	___	26-17	___	___	___	___	___
26-18	___	___	___	___	___	26-19	___	___	___	___	___
26-20	___	___	___	___	___	26-21	___	___	___	___	___
26-22	___	___	___	___	___	26-23	___	___	___	___	___
26-24	___	___	___	___	___	26-25	___	___	___	___	___
26-26	___	___	___	___	___	26-27	___	___	___	___	___
26-28	___	___	___	___	___	26-29	___	___	___	___	___
26-30	___	___	___	___	___	26-31	___	___	___	___	___

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 8=Fwd 12=Test Menu

Figure 351. LU Assignments to CUT Terminal Ports

1 Here we assign the logical LUs per each HOST system definition to the CUT terminals that are coax-attached to the controller. What really happens to the terminal is that it has four sessions to the host (two sessions to Host 1A and two sessions to Host 1B).

Line 26-00 tells the terminal to get session LU 02 from Host definition 1A for the first session. The next session under LT2 is Host LU 02 again but from Host 1B this time. LT3 is LU session 06 from Host 1A and the last session is with session LU 06 from Host 1B. In this case, when you jump sessions you go from Host 1A to Host 1B.

Defining the 3174 APPN Resources

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 4
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point(614-615)
614 FP NAME - _____ 615 FP NETID - _____

Report to Alert Focal Point(616)
616 HOST LINKS - _ _ _ _ _

DLUS Primary Host Name(620-621)
620 CPNAME - _____ 621 NETID - USIBMRA

DLUS Backup Host Name(622-623)
622 CPNAME - _____ 623 NETID - _____

_____

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 352. APPN Node Definition Panel

Adjacent Network Resources

```

_____ Network Resources _____

      CPNAME  NODE TYPE  LUs  DLC TYPE  ADDRESS  DLCI
              (1-4)    (X)   (1-6)
1  RAK _____ 1 3      -      6 3  _____
2  RAI _____ 2 3      -      6  _____

Select Test; press ENTER ==>

PF: 3=Quit 7=Back 12=Test Menu

```

Figure 353. Network Resources

1 RAK is the CPNAME of the Subarea/APPN Host 1B. The link to the host is shared between T2.0 (for DSPU and coax devices) and T2.1 (for the APPN NN link).

2 RAI is the CPNAME of the Subarea/APPN Host 1A. This link also carries shared T2.0/T2.1 traffic.

3 A new DLC type (6) has been introduced here indicating ESCON channel attachment. By specifying the CPNAMEs for RAI and RAK, the 3174 will attempt to initiate a connection to these hosts immediately following an IML. Should a link failure occur, the 3174 will attempt to re-establish the CP-CP session.

18.3.4 3174 Online Test Panels after IML

For complete details of tests that are available for the 3174, please refer to *3174 Establishment Controller - Customer Problem Determination*, GA23-0217.

3270 Session Status:

To reach the 3270 Host Status Summary panel, select Option 15 on the 3174 Test Menu panel.

3270 Host Status Summary					
ID	Host Descriptor	HG	Attach	Connection	Status
1A	SY18 1	17	2 L-SNA	3 500-01 Up	4
1B	SY20	17	L-SNA	500-01 Up	
To go directly to other tests, enter: /Test,Option Select Test; press ENTER ==>					
PF: 3=Quit 5=Refresh 12=Test Menu					

Figure 354. Host Session Status /15

- 1** This is the name from the Multi-Host Definition panel.
- 2** HG17 is the Hardware group for the ESCON Channel connection.
- 3** Attached as a LOCAL SNA controller.
- 4** The status of the PU is active.

Main APPN Test Menu

APPN Test Menu	
Option	Description
1	Display Node Status
2	Display Adjacent Nodes
3,N.C	Display Link Status (N.C = NETID.CPNAME)
4(,x)	Display Session Status (x = Status Type; P=Pending, A=Active, T=Terminating)
5,P.N.C	Display Pending Session Route (P.N.C. = PCID.NETID.CPNAME)
6	Display Active Locate Requests
7	Display Local LU 6.2 Session Status
NOTE: The Link Status Test can also be run by executing the Adjacent Nodes Test and selecting a LINK ID. The Pending Session Route Test can also be run by executing the Session Status Test and selecting a SESSION NUMBER. PCID, NETID, and CPNAME parameters are case sensitive.	
To go directly to other tests, enter: /Test,Option Select Option; press ENTER ==>	
PF: 3=Quit 12=Test Menu	

Figure 355. APPN Test Menu

Display Node Status Panel

```

      _____ Node Status _____
NETID: USIBMRA      CPNAME: CP31743      Type: NN 1      Max Links: 225

Adjacent End/LEN Nodes
Customized: 0      Active: 3

Adjacent Network Nodes
Customized: 2 2      Active: 2 2

Max Intrmed Sessions: 500      Active Intrmed Sessions: 14

Registered Entries: 0      Home Entries: 2

Cache Entries: 10      Rte Add Res: 128

Pool Buffer Usage: 1 %      Congestion: NO

Data Buffer Usage: 1 %      Session Resource Depletion: NO

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

```

Figure 356. Node Status Panel /17,1

1 Confirmation we are a network node.

2 Number of LEN nodes customized (in our case RAI and RAK). To the right, you can see confirmation that both are active.

Display Adjacent Nodes Panel

```

      _____ Adjacent Nodes _____

LINKID  NETID  CPNAME  Type  Status  State  Num Sess  CP-CP
-----
1  USIBMRA  RAI      NN  OPEN    08 1  4 2  YES
2  USIBMRA  CM32241  EN  OPEN    08    10  YES
3  USIBMRA  CM41992  EN  OPEN    08     3  YES
5  USIBMRA  RAK      NN  OPEN    08    10  YES
6  USIBMRA  CM41992  EN  OPEN    08     5  NO

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>
4729-Enter the LINKID to run Link Status Test
4729-Enter the LINKID to run Link Status Test

PF: 3=Quit 5=Refresh 12=Test Menu

```

Figure 357. Adjacent Nodes Panel /17,2

1 State 08 confirms the status of the Link is open.

2 This shows the number of intermediate LU-LU sessions on the link currently pending activation, active, or pending termination.

Display Link Status Panel

Link Status						
NETID	CPNAME	Type	Status	State	Route Addition Resistance	
USIBMRA	RAI	NN	OPEN	08	128	
RCV Slam	SND Slam	Combined PU 2.0	Number APPN Sess		Congestion	Session Resource Depletion
NA	NO	YES 1	4		NO	NO
Adapter Type	Local Address	TG	HG	Remote Address		Product Information
CHANNEL	60	15	17 2			ACF/VTAM

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 358. LINKID Test 1 from Previous Panel

- 1** Confirmation we carry both T2.1/T2.0 traffic
- 2** Using the ESCON channel connection to the host

Display Link Status Panel

Link Status						
NETID	CPNAME	Type	Status	State	Route Addition Resistance	
USIBMRA	CM41992	EN	OPEN	08	255	
RCV Slam	SND Slam	Combined PU 2.0	Number APPN Sess		Congestion	Session Resource Depletion
YES	NO	YES 1	3		NO	NA
Adapter Type	Local Address	TG	HG	Remote Address		Product Information
TR	400031740003	15	31 2	40003174199204		8565000

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 359. LINKID Test 3 from Adjacent Nodes Panel

- 1** Confirmation we carry both T2.1/T2.0 traffic
- 2** Using the token-ring card for connection to the EN

Active Sessions Display

Session Status								
Num	PCID	NETID	CPNAME	Status	ST	1	OLU 2	DLU 3
4	F8D3D16495D3D4F5	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM32241
5	CF2FAC3077BF1D3C	USIBMRA	CM41992	ACTIVE	00		CM41992	CM32241
6	F8D3D16495D3D51E	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM41992
7	CF2FAC3078BF1D3C	USIBMRA	CM41992	ACTIVE	00		CM41992	RAKAZ
8	CF2FAC3076BF1D3C	USIBMRA	CM41992	ACTIVE	00		CM41992	CM32241
9	F8D3D16495D3D51F	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM41992
10	F8D3D16495D3D4F4	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM32241
12	EEFFC38B969135C0	USIBMRA	CM32241	ACTIVE	00		CM32241	RAI
13	EEFFC38B959135C0	USIBMRA	CM32241	ACTIVE	00		CM32241	RAI
16	F8D3D16495D3D4F3	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM32241
23	EEFFC38B989135C0	USIBMRA	CM32241	ACTIVE	00		CM32241	RAKAZ
24	EEFFC38B999135C0	USIBMRA	CM32241	ACTIVE	00		CM32241	RAKAZ
25	CF2FAC307CBF1D3C	USIBMRA	CM41992	ACTIVE	00		CM41992	RAKAZ
26	F8D3D16495D3D51D	USIBMRA	RAK	ACTIVE	00		RAKAZ	CM41992

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 4730-Enter the NUM to run the Pending Session Route Test
 Test 4730-Enter the NUM to run the Pending Session Rout
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 360. Session Status Panel /17,4

1 ST shows a finite state machine value representing the current state of the session. In this case, 00= Session Operating Normally.

2 Specifies the name of the originating logical unit of the session.

3 Specifies the name of the destination logical unit of the session.

Session Display for LU 6.2

LOCAL LU 6.2 Session Status							
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU	
EEFFC38B909135C0	USIBMRA	CM32241	ACTIVE	02	1 CPSVCMG	CM32241	
EE4B78FF1C5F6169	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM32241	
CF2FAC3071BF1D3C	USIBMRA	CM41992	ACTIVE	02	CPSVCMG	CM41992	
EE4B78FF1C5F6168	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM41992	
EE4B78FF1C5F615C	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAK	
F8D3D16495D3BED4	USIBMRA	RAK	ACTIVE	02	CPSVCMG	RAK	
EE4B78FF1C5F615E	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAI	
F86FE164D69E21C4	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI	

To go directly to other tests, enter: /Test,Option
 Select Option; press ENTER ==>
 PF: 3=Quit 5=Refresh 12=Test Menu

Figure 361. LU 6.2 Session Status Panel /17,7

1 ST 02 = Session Operating Normally

18.3.5 VTAM Definitions

Host 1A

```

*-----* 00000100
*          LOCAL 3174-1A PRIMARY HOST ESCON GWAY 360-363 * 00000200
*-----* 00000300
HSN3060 VBUILD TYPE=LOCAL
RAPP60 PU CUADDR=360 1, ISTATUS=ACTIVE, PUTYPE=2, MAXBFRU=10, 00000500
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00000600
          VPACING=0, XID=YES, CPNAME=CP31743, DYNLU=YES 00000700
*          2 3 4 00000800
RAPT600 LU LOCADDR=2 00000900
RAPT601 LU LOCADDR=3 00001000
RAPT602 LU LOCADDR=4 00001100
RAPT603 LU LOCADDR=5 00001200
RAPT604 LU LOCADDR=6 00001300
RAPT605 LU LOCADDR=7 00001400
RAPT606 LU LOCADDR=8 00001500
RAPT607 LU LOCADDR=9 00001600
RAPT608 LU LOCADDR=10 00001700
RAPT609 LU LOCADDR=11 00001800
RAPP61 PU CUADDR=361, ISTATUS=INACTIVE, PUTYPE=2, MAXBFRU=10, *00001900
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00002000
          VPACING=0, SECNET=YES 00002100
*          00002200
RAPT610 LU LOCADDR=2 00002300
RAPT611 LU LOCADDR=3 00002400
RAPT612 LU LOCADDR=4 00002500
RAPT613 LU LOCADDR=5 00002600
RAPT614 LU LOCADDR=6 00002700
RAPT615 LU LOCADDR=7 00002800
RAPT616 LU LOCADDR=8 00002900
RAPT617 LU LOCADDR=9 00003000
RAPT618 LU LOCADDR=10 00003100
*-----* 00003400
*
* .....etc
*
*-----* 00003400
RAPQ63 PU CUADDR=363, ISTATUS=INACTIVE, PUTYPE=2, MAXBFRU=10, *00003500
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00003600
          VPACING=0, SECNET=YES 00003700
*          00003800
RAPT630 LU LOCADDR=2 00003900
RAPT631 LU LOCADDR=3 00004000
RAPT632 LU LOCADDR=4 00004100
RAPT633 LU LOCADDR=5 00004200
RAPT634 LU LOCADDR=6 00004300
RAPT635 LU LOCADDR=7 00004400

```

Figure 362. VTAM Major Node Definition for Addresses 360-363 on 1A

- 1** This is the CUADDR address from VTAM for Host 1A.
- 2** XID = Yes; this is required for LU 6.2 independent sessions.
- 3** CPNAME not required but if coded *must* match 3174 entry.
- 4** Use DYNLU = yes to dynamically allocate independent sessions; if you do not code this, you must code LOCADDR=0 for your independent LU 6.2 sessions.
- 5** The upper value we have for devices defined in Host 1A Question 105.

Host 1B

```

*-----* 00000100
*      LOCAL 3174-1A PRIMARY HOST ESCON GWAY 380-383 * 00000200
*-----* 00000300
HSN3080 VBUILD TYPE=LOCAL 00000400
RAPP80 PU CUADDR=380 1, ISTATUS=ACTIVE, PUTYPE=2, MAXBFRU=10, 00000500
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00000600
          VPACING=0, PACING=0, DISCNT=NO, SSCPFM=FSS, *00000700
          XID=YES, DYNLU=YES 00000800
* 00000900
RAPT800 LU LOCADDR=2 00001000
RAPT801 LU LOCADDR=3 00001100
RAPT802 LU LOCADDR=4 00001200
RAPT803 LU LOCADDR=5 00001300
RAPT804 LU LOCADDR=6 00001400
RAPT805 LU LOCADDR=7 00001500
RAPT806 LU LOCADDR=8 00001600
RAPT807 LU LOCADDR=9 00001700
RAPT808 LU LOCADDR=10 00001800
RAPT809 LU LOCADDR=11 00001900
*-----* 00002200
RAPP81 PU CUADDR=381, ISTATUS=INACTIVE, PUTYPE=2, MAXBFRU=10, *00002300
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00002400
          VPACING=0, SECNET=YES 00002500
* 00002600
RAPT810 LU LOCADDR=2 00002700
RAPT811 LU LOCADDR=3 00002800
RAPT812 LU LOCADDR=4 00002900
RAPT813 LU LOCADDR=5 00003000
RAPT814 LU LOCADDR=6 00003100
RAPT815 LU LOCADDR=7 00003200
RAPT816 LU LOCADDR=8 00003300
RAPT817 LU LOCADDR=9 00003400
RAPT818 LU LOCADDR=10 00003500
*-----* 00003800
*
*
* ..... etc
*
*-----* 00003800
RAPQ83 PU CUADDR=383, ISTATUS=INACTIVE, PUTYPE=2, MAXBFRU=10, *00003900
          MODETAB=AMODETAB, DLOGMOD=M2SDLCQ, USSTAB=US327X, *00004000
          VPACING=0, SECNET=YES 00004100
* 00004200
RAPT830 LU LOCADDR=2 00004300
RAPT831 LU LOCADDR=3 00004400
RAPT832 LU LOCADDR=4 00004500
RAPT833 LU LOCADDR=5 00004600
RAPT834 LU LOCADDR=6 00004700
RAPT835 LU LOCADDR=7 00004800
RAPT836 LU LOCADDR=8 00004900
RAPT837 LU LOCADDR=9 00005000

```

Figure 363. VTAM Major Node Definition for Addresses 380-383 on 1B

1 This is the CUADDR address from VTAM for Host 1B.

18.3.6 VTAM Displays

PU of the 3174 for Host 1A

```

COMMAND INPUT ==>                                SCROLL ==> PAGE
D NET,ID=RAPP60,E
IST075I NAME = RAPP60, TYPE = PU_T2.1 1 171
IST486I STATUS= ACTIV--L-- 2 , DESIRED STATE= ACTIV
IST1043I CP NAME = CP31743, CP NETID = USIBMRA, DYNAMIC LU = YES
IST1105I RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I RAPP60 AC/R 3 21 YES 982D0000000000000000000017100808080
IST136I LOCAL SNA MAJOR NODE = RAPQ60J
IST077I SIO = 19239 CUA = 0360
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST355I LOGICAL UNITS:
IST080I RAPT600 ACTIV          RAPT601 ACTIV          RAPT602 ACTIV
IST080I RAPT603 ACTIV          RAPT604 ACTIV          RAPT605 ACTIV
IST080I RAPT606 ACTIV          RAPT607 ACTIV          RAPT608 NEVAC
IST080I RAPT609 NEVAC
IST080I CM32241 ACT/S----Y CP31743 ACT/S----Y 4
IST314I END

```

Figure 364. Status of PU with VTAM

- 1** Lets you know that this PU will accept T2.1 traffic.
- 2** --L-- An independent LU is using this PU as an adjacent link station.
- 3** AC/R means Active and reported APPN topology and routing services.
- 4** ----Y The cross-domain resource (CDRSC) was created dynamically.

Display or Partner LU on Host 1B

```

COMMAND INPUT ==>                                SCROLL ==> PAGE
D NET,ID=RAKAZ,E
IST097I DISPLAY ACCEPTED
IST075I NAME = USIBMRA.RAKAZ, TYPE = APPL 844
IST486I STATUS= ACT/S, DESIRED STATE= ACTIV
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST861I MODETAB=APPCMODE USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=#INTER USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I APPL MAJOR NODE = RAKTELL
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST271I JOBNAME = APPC, STEPNAME = APPC, DSPNAME = IST958C5
IST1050I MAXIMUM COMPRESSION LEVEL - INPUT = 0, OUTPUT = 0
IST171I ACTIVE SESSIONS = 0000000010, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME      STATUS 1 SID          SEND RECV VR TP NETID
IST635I CM41992  ACTIV-S  F8D3D16495D3D51F 0001 0000 0 0 USIBMRA
IST635I CM41992  ACTIV-S  F8D3D16495D3D51E 0001 0000 0 0 USIBMRA
IST635I CM41992  ACTIV-S  F8D3D16495D3D51D 0001 0003 0 0 USIBMRA
IST635I CM32241  ACTIV-S  F8D3D16495D3D4F5 0001 0000 0 0 USIBMRA
IST635I CM32241  ACTIV-S  F8D3D16495D3D4F4 0001 0000 0 0 USIBMRA
IST635I CM32241  ACTIV-S  F8D3D16495D3D4F3 0001 0000 0 0 USIBMRA
IST635I CM41992  ACTIV-P  CF2FAC307CBF1D3C 001F 004D 0 0 USIBMRA

```

Figure 365. Sessions with APING Partner LU

- 1** Session state suffixes (-P and -S)
 - If the session state is displayed with a suffix of -P, for example ACTIV-P, the resource is the primary LU.
 - If the session state is displayed with a suffix of -S, for example ACTIV-S, the resource is the secondary LU.

18.3.7 PS/2 Configuration

NDF file

```
DEFINE_LOCAL_CP FQ_CP_NAME(USIBMRA.CM41992 )
                CP_ALIAS(CM41992 )
                NAU_ADDRESS(INDEPENDENT_LU)
                NODE_TYPE(EN) 1
                NODE_ID(X'05D41992')
                NW_FP_SUPPORT(NONE)
                HOST_FP_SUPPORT(YES)
                HOST_FP_LINK_NAME(RAI001 )
                MAX_COMP_LEVEL(NONE)
                MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(RAI001 )
                   ADJACENT_NODE_TYPE(LEARN)
                   DLC_NAME(IBMTRNET)
                   ADAPTER_NUMBER(0)
                   DESTINATION_ADDRESS(X'40003174000304') 2
                   ETHERNET_FORMAT(NO)
                   CP_CP_SESSION_SUPPORT(YES)
                   SOLICIT_SSCP_SESSION(YES)
                   NODE_ID(X'05D41992')
                   ACTIVATE_AT_STARTUP(YES)
                   USE_PUNAME_AS_CPNAME(NO)
                   LIMITED_RESOURCE(USE_ADAPTER_DEFINITION)
                   LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                   MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                   EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                   COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                   COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                   SECURITY(USE_ADAPTER_DEFINITION)
                   PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_LOGICAL_LINK LINK_NAME(RAK01 )
                   ADJACENT_NODE_TYPE(LEN)
                   DLC_NAME(IBMTRNET)
                   ADAPTER_NUMBER(0)
                   DESTINATION_ADDRESS(X'40003174000308') 3
                   ETHERNET_FORMAT(NO)
                   CP_CP_SESSION_SUPPORT(NO)
                   SOLICIT_SSCP_SESSION(YES)
                   PU_NAME(RAPP81 )
                   NODE_ID(X'05D41992')
                   ACTIVATE_AT_STARTUP(YES)
                   USE_PUNAME_AS_CPNAME(NO)
                   LIMITED_RESOURCE(USE_ADAPTER_DEFINITION)
                   LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                   MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                   EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                   COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                   COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                   SECURITY(USE_ADAPTER_DEFINITION)
                   PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_DEFAULTS IMPLICIT_INBOUND_PLU_SUPPORT(YES)
                DEFAULT_MODE_NAME(BLANK)
                MAX_MC_LL_SEND_SIZE(32767)
                DIRECTORY_FOR_INBOUND_ATTACHES(*)
                DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
                DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
                DEFAULT_TP_CONV_SECURITY_RQD(NO)
                MAX_HELD_ALERTS(10);

START_ATTACH_MANAGER;
```

Figure 366. NDF File for APPN and Multi-Host 3270 Sessions

- 1** End node type with independent session requested.
- 2** SAP ID of 04 for 3270 session to Host 1A
- 3** SAP ID of 08 for 3270 session to Host 1B

18.3.8 PS/2 VERIFICATION

APING TO S/390

```
OS2 C:\>aping USIBMRA.RAKAZ -n

APING version 2.38 APPC echo test with timings.
  by Peter J. Schwaller (pjs@ralvm6.vnet.ibm.com)

Allocate duration:                      0 ms

Connected to a partner running on: MVS

Program startup and Confirm duration:    2430 ms

      Duration      Data Sent      Data Rate      Data Rate
      (msec)        (bytes)        (KB/s)         (Mb/s)
      -----
          30           444          14.5          0.116
          30           444          14.5          0.116
          60           444           7.2          0.058
          70           444           6.2          0.050
          30           444          14.5          0.116
          30           444          14.5          0.116
Totals:    250         2664          10.4          0.083

Duration statistics:  Min = 30  Ave = 41  Max = 70
```

Figure 367. APING Statistics

3270 VTAM Logos



Figure 368. VTAM Logos from RAI (18) and RAK (20) from CM41992

Chapter 19. APPN Management Services Support and Scenarios

The primary purpose of the APPN MS architecture is to provide a mechanism for transporting MS data over LU 6.2 sessions so that the network manager does not have to be located at the SSCP. The key concepts of the MS architecture for APPN nodes are briefly defined here. For a complete description refer to *SNA Management Services Reference*, SC30-3346.

Entry Point (EP)

A node that sends MS data about itself and the resources in its domain to a focal point for centralized processing.

Focal Point (FP)

Centralized distributor of MS requests and collector of MS data. Examples are NetView, CM/2, and AS/400. There are two types of focal points (primary and backup). The primary is the preferred destination for a particular management services category. A backup focal point is used when no primary destination is available.

Multiple Domain Support (MDS)

This is the transport mechanism for MS data units, utilizing LU 6.2 sessions with additional MDS headers for routing and transaction control. Between APPN network nodes and their served ENs, MDS shares the CP-CP sessions that are already in use for APPN control point flows. Between entry points (NNs or ENs) and focal points, MDS uses a pair of LU 6.2 sessions (contention winner and contention loser) with the SNASVCMG mode. Several service transaction programs (STPs) are part of MDS; the most important ones are MDS_SEND and MDS_RECEIVE.

Categories of Service

MS architecture groups MS data into the following categories:

- Problem Management (for example, alerts)
- Performance and Accounting (for example, RTM)
- Configuration Management (for example, PSID)
- Change Management (Installation, for example, CSCM)
- Operations Management (Activation, for example, CSCF)

Each entry point reports to only one focal point for each category of service, but different categories can have different focal points. Some categories, such as RTM, are not supported via MDS transport and must, therefore, be carried on an SSCP-PU session.

MS Applications

Several MS applications are architected for each node, to support the various categories of service at the entry point and focal point, and to support establishment of entry point-to-focal point affiliations. These applications do not interface directly to LU 6.2 as transaction programs, but interface to MDS for transport services. The naming convention used here and in the architecture is

XXXX_NETOP for applications residing in the focal point, and EP_XXXX for applications in the entry point. For example, ALERT_NETOP is the focal point application that receives and displays/logs alerts, and EP_ALERT is the entry point application in the 3174 that creates alerts to send.

Non-architected MS applications can use MDS transports to communicate any type of MS data, such as APPN topology data used by the NetView APPNTAM feature.

MS_CAPS

MS Capabilities is an architected MS application that supports the establishment of EP-to-FP relationships.

The EP-to-FP relationship (for primary or backup focal points) can be established three ways:

- Explicitly
The focal point notifies the entry point. This requires definition of served EPs at the FP.
- Implicitly
The entry point requests support from the focal point. This requires definition of desired FP at the EP.
- Default
The focal point offers its services to NNs in the APPN topology database.

The architecture ranks FP-EP relationships as follows:

1. Explicit primary
2. Implicit primary
3. Backup (implicit or explicit)
4. Default primary
5. Backup (default)
6. Pseudo focal point

CP_MSU

The Control Point Management Services Unit is a major vector, such as an alert, contained in a specific GDS variable rather than the NMVT header. It is the APPN MS equivalent of NMVT.

NMVT

Network Management Vector Transport. This is the encoding used for sending management data on SSCP-PU sessions.

MDS_MU

MDS_MU is a CP_MSU encapsulated in an MDS header for routing purposes.

19.1 APPN MS Functions in Configuration Support-C Release 5 and Later

APPN Management Services (MS) functions were first introduced in Configuration Support-C Release 5. This section provides you with an overview of the functions supported by the 3174 when running Configuration Support-C5 and later.

19.1.1 EP_ALERT Function

Throughout this section the phrase *alert focal point* means specifically the APPN control point that contains the ALERT_NETOP function. This is *not* the SSCP.

Generic vs Product-Specific Alerts

The 3174 sends both generic (for APPN, token-ring, LAN LLC, and ISDN gateway) and product-specific (for all other conditions) alerts to the alert focal point.

Host-Specific Alerts

The 3174 can operate in a multi-host environment, providing a separate SSCP-PU session to each host. To determine which SSCP-PU session a particular alert should be sent on, every alerting condition in the 3174 is defined as being host-specific or not. Host-specific alerts are those associated with particular dependent LUs (directly attached, or being serviced by the gateway feature), or associated with a particular host logical connection. Host-specific alerts are currently sent on the SSCP-PU session to the affected host. Non-host-specific alerts are those that reflect conditions affecting more than a single LU or host, such as hardware or microcode problems.

In a non-APPN single-link multiple host environment, one host is designated as the receiver for non-host-specific alerts. Configuration Question 220 controls which hosts are to receive host-specific alerts (and CMIP events), and Question 221 controls which host is to receive all non-host-specific alerts.

Note: The publications refer to the receiver of non-host specific alerts as the *alert control point*, but this should not be confused with the APPN control point. The two uses of *control point* are not related in any way.

In an APPN environment when there is an alert focal point, all non-host-specific alerts are sent to it, but by default the host-specific alerts will continue to be sent on the SSCP-PU session to the host associated with the dependent LU or the failing link. Configuration Question 616 gives the ability to override this default routing and specify hosts whose alerts are to be sent to the alert focal point, rather than to the SSCP. Only alerts for hosts on the primary link (1A-1H) can be routed to the alert focal point. Host-specific alerts for 2A-2D or 3A-3D hosts continue to be sent on the SSCP-PU session to the appropriate host. The rationale for not allowing host-specific alerts for 2x or 3x hosts to be routed on APPN is that APPN is not supported for the 2x or 3x hosts.

Questions 220 and 221 apply only to the sending of alerts over SSCP-PU sessions. Therefore all non-host-specific alerts are sent to the APPN focal point (if one exists), regardless of the answer to Question 220 or 221. If a host is listed in Question 616, its alerts are sent to the APPN focal point, overriding the answer to Question 220. If a host is not listed in Question 616, Question 220 controls whether host-specific alerts are sent on the SSCP-PU session.

Operator-Generated Alerts

These alerts are sent only on the SSCP-PU session to the operator designated host. There is no way to send operator-generated alerts to the APPN focal point.

Delayed Alerts

When there is an active alert focal point, it is not necessary to delay alerts related to failures on the SSCP-PU session or host link. If the session to the alert focal point is not active, the 3174 reverts to the previous mode of operation, sending the alerts on the SSCP-PU session. For this reason, and because MS architecture does not support sending of delayed alerts to an alert focal point, no generic alerts transmitted to the alert focal point are flagged as delayed in the generic alert header. However, the current 3174 function of storing hard failure conditions in a hardware register for subsequent alerting after re-IML is maintained. These non-generic alerts may have an alert type of *delayed*, even when transmitted to the alert focal point.

Held-Alerts (Queuing of Alerts)

Held alerts are those alerts that could not be sent because there is no alert focal point. The EP_ALERT optional subset to hold alerts for the focal point is not supported, so no alerts transmitted to the focal point are flagged as held. Instead, the SSCP is assumed to be available to receive alerts if the focal point is not available.

The existing 3174 function of priority queuing for non-generic alerts for transmission on the SSCP-PU session is maintained, even when there is an alert focal point. At the time an alert is to be transmitted, the decision is made to send the alert to the focal point, rather than the SSCP.

Alerts to be sent to the focal point are then queued in a FIFO manner, with no priority. At most, eight alerts can be queued for the focal point. If the maximum number of alerts are queued for the focal point and another alert needs to be transmitted, the alert is lost.

19.1.2 MS_CAPS

The 3174 supports the architected base functions for an NN, including having a backup or implicit focal point. It also supports having a subarea focal point, which is the existing support for sending alerts on the SSCP-PU session.

Focal Point Establishment

When no focal point is customized, the 3174 waits to be contacted by the focal point and uses the SSCP-PU session for sending alerts.

When a focal point is customized, the 3174 requests services from the focal point after IML. If the request is rejected, the 3174 reverts to the SSCP-PU session for sending alerts.

When conflicts occur during focal point establishment, the ranking listed in the definition for MS_CAPS is used to determine which focal point is accepted.

When a higher ranking focal point makes contact and there is already a focal point, the current focal point is REVOKED prior to accepting the new focal point.

Focal Point Recovery

For proper recovery of focal point relationships after IML, it is necessary to save the current focal point information in non-volatile storage whenever it changes.

If the 3174 has to be IMLed for any reason, it tries to reacquire the previous primary focal point (if retry is the responsibility of the entry point) unless a new implicit focal point has been configured. If a new focal point has been configured, the 3174 tries to acquire the new focal point and if successful, it revokes the previously active focal point. The basic idea is to allow the most recently defined focal point information to be used.

When the 3174 is responsible for recovering a lost primary focal point, it requests focal point services every three minutes until the primary focal point is recovered or a new focal point is configured.

Backup Focal Point

When an explicit focal point contacts the 3174, it can specify a backup focal point. In this case the 3174 tries to acquire the backup focal point if the primary focal point is lost. However, the 3174 continues to try to re-acquire the primary focal point as described in the previous section. It does not retry acquiring the backup focal point if it is lost. If no other focal point is available for the alerts category, the 3174 reverts to sending alerts on the SSCP-PU session and acts as a pseudo-focal point for its served end nodes.

There is no configuration to implicitly specify a backup focal point.

Default Focal Point

The 3174 accepts requests from a default focal point, if no higher ranking focal point is active.

19.2 Environment

The APPN MS enhancements are useful for the following reasons:

- There is an APPN focal point for alerts (or other categories) defined in the network. An alert focal point is provided by NetView V2R2 and later releases, AS/400, and user applications on CM/2.
- To provide default routing transport for served ENs. This allows EN MS data to utilize the CPSVCMG session to the 3174 NN rather than having dedicated MS sessions.

Figure 369 on page 322 is a logical view of one APPN configuration, showing some of the elements involved in APPN Management Services.

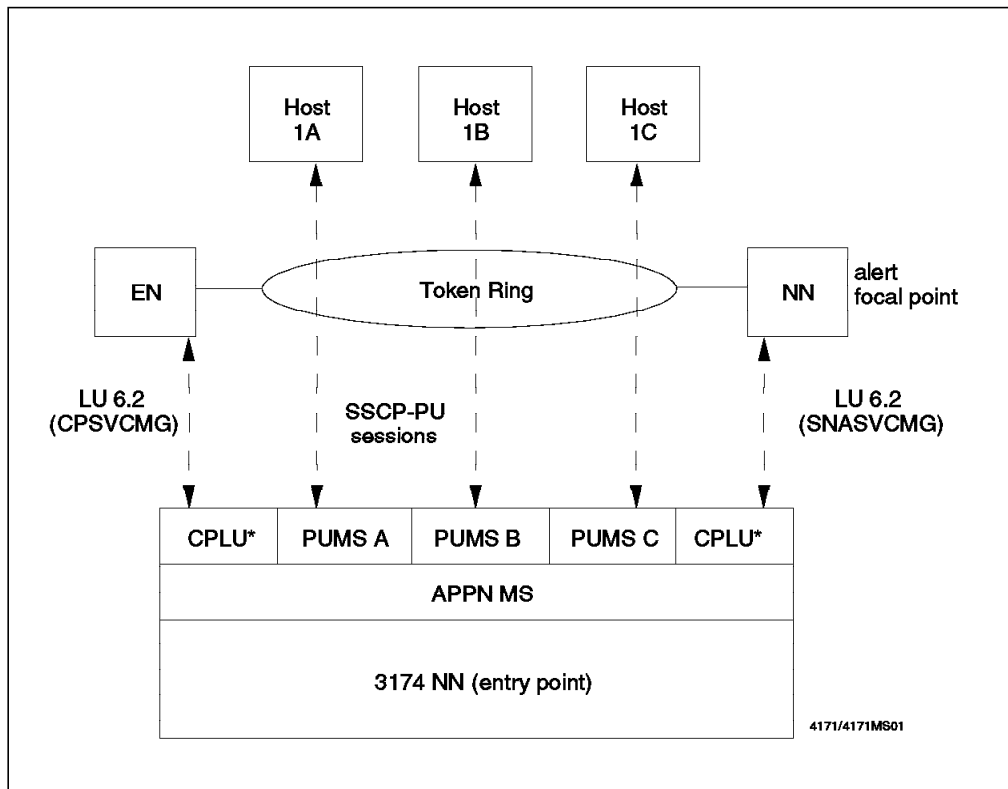


Figure 369. APPN MS Logical Environment

Notes:

1. CPLU- Control Point LU (single LU, drawn separately for convenience).
2. PUMS- Physical Unit Management Services (three separate PUs).
3. Solid lines represent physical connections to the token-ring network.
4. Dotted lines represent logical sessions.

Figure 369 shows a 3174 network node token-ring-attached to multiple hosts. The hosts provide SSCP services for dependent LUs (not shown), and for PU management. The 3174 provides NN services for the token-ring-attached EN, and it has a focal point for alerts. There is actually a pair of LU 6.2 sessions to the EN and a pair of LU 6.2 sessions to the focal point (one for sending, and one for receiving data). Alerts received from the EN on the CPSVCMG session are forwarded to the focal point on an SNASVCMG session. Alerts generated within the 3174 are also sent to the focal point. The SSCP-PU session is still used for non-bulk management services data other than alerts.

Although it is not shown in this figure, there could be LU 6.2 sessions to focal points for categories of service other than alerts. The only MS data flowing to these focal points is passed through (via MDS routing) from an EN, since the only entry point function supported by 3174 is alerts. Another function not shown in this figure is the routing of any application MDS data from served ENs to partner applications anywhere in the APPN network.

19.3 APPN Focal Point Management Services to NetView LU

In this scenario we use Configuration Support-C Release 6 to show how to set up for an APPN focal point on another HOST in the same APPN network. We will point to the NETVIEW CPNAME in this scenario.

19.4 Configuration

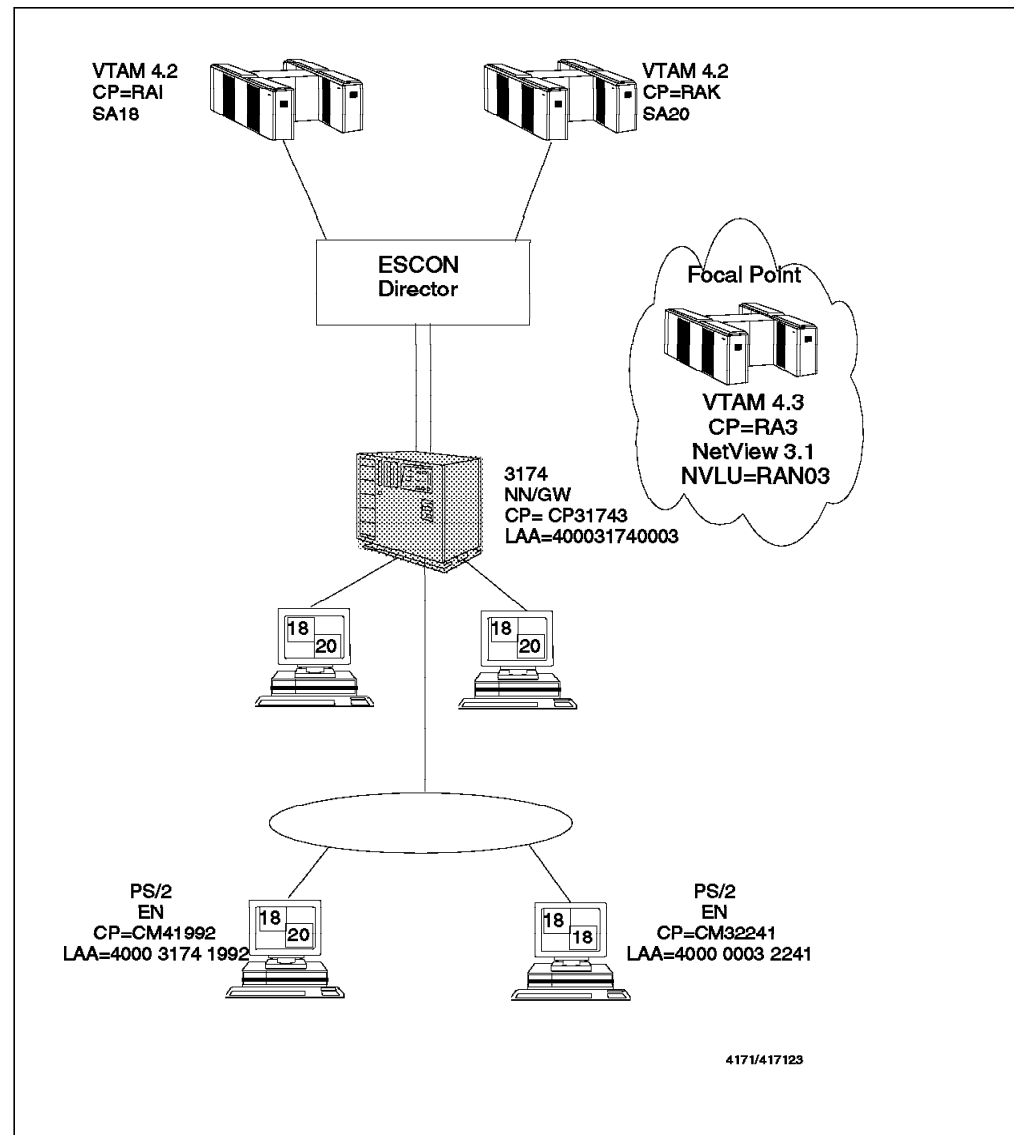


Figure 370. Scenario Configuration

19.5 Definition Overview

This scenario shows how to configure the 3174 to send alert data to our NetView Focal point. We use the same 3174 customizing data we used in Chapter 18, “APPN over 3174 ESCON Channel Connection” on page 297.

For this scenario we only show any changes we made in the 3174 and any differences in the 3174 Online Test displays.

The composite network has the following components:

- Two S/370 hosts with VTAM V4.R2
- 9032 ESCON director
- 3174-12L (CP31743)
 - APPN NN
 - Token-ring gateway
- PS/2 EN (CM41992)
 - End node
 - Multi-Host via SAPs
 - Token-ring address (400031741992)
- PS/2 EN (CM32241)
 - End node
 - Token-ring address (400000032241)

For the Focal Point Host we use:

- S/370 host with VTAM V4.R3
- NetView V3.R1
- LU name RAN03

19.5.1 3174-12L Customization

APPN Definition Panel

APPN Node Definition

610 SESSIONS - 2 611 NODES/LINKS - 4

612 WILDCARD - 0 613 HOST LINK - 1A

Alert Focal Point(614-615)

614 FP NAME - RAN03 **1** 615 FP NETID - USIBMRA **2**

Report to Alert Focal Point(616)

616 HOST LINKS - 1A 1B **3** _ _ _ _ _

DLUS Primary Host Name(620-621)

620 CPNAME - 621 NETID - USIBMRA

DLUS Backup Host Name(622-623)

622 CPNAME - 623 NETID -

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

Figure 371. Adding Focal Point NAME and NETID

1 In this case we use the LU name for NetView on system RA3 to send the alerts.

The session end point of the MS transport can be moved from the NetView, as an LU, to VTAM, as a control point. This consolidates the MS transport sessions to VTAM CP when VTAM is an APPN NN. It also enables end nodes that are being served by the VTAM NN to find out about their domain focal point and forward data to the focal point through their serving NN.

Use the VTAMCP USE=YES NetView definition statement in DSIDMN to specify that NetView MS transport uses the VTAM CP to send and receive data.

This function requires VTAM V4R1 and NetView V2R4 for the focal point enhancements. NetView can still be the session end point of the MS transport in V2R4, even if it is running on a VTAM V4R1 node. Existing applications do not need to be modified if you wish to continue to use the existing MS transport functions.

2 NETID of the Focal Point Alert monitor.

3 Send all alerts generated for both hosts to the Focal Point.

19.5.2 Online Tests

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
EEFFC38B9377B487	USIBMRA	CM32241	ACTIVE	02	CPSVCMG	CM32241
EE4B78FF1B30CADD	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM32241
CF2FAC3073C60BED	USIBMRA	CM41992	ACTIVE	02	CPSVCMG	CM41992
EE4B78FF1B30CAFB	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM41992
EE4B78FF1B30CAF7	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAI
F86FE164D8FA759E	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI
EE4B78FF1B30CAF8	USIBMRA	CP31743	ACTIVE	02	SNASVCMG	RAN03 1
EE4B78FF1B30CAF9	USIBMRA	CP31743	ACTIVE	02	SNASVCMG 2	RAN03
EE4B78FF1B30CAFA	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAK
F8D3D16497DF3F9F	USIBMRA	RAK	ACTIVE	02	CPSVCMG	RAK

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 372. Online Test Panel /17,7

1 From this display on the 3174 we can see that we have some active LU6.2 sessions from the 3174 CP to the LU for NetView on system RA3.

2 We are using Mode SNASVCMG which is used for CNOS and management services sessions.

19.5.3 NetView System Displays

CNM1NETV	NETVIEW VERSION 3 RELEASE 1 1 MAIN MENU
OPERATOR ID = PEPE	APPLICATION = RAN03008
Enter a command (shown highlighted or in white) and press Enter.	
Browse Facility	BROWSE
Command Facility	NCCF
Help Facility	HELP
Hardware Monitor	NPDA
4700 Support Facility	TARA
Session Monitor	NLDM
Status Monitor	STATMON
News	NEWS
PF Key Settings	DISPFK
Automated Operations Network/MVS	AON
To Exit the NetView Program	LOGOFF
TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'	
Action====> npda 2	

Figure 373. Main NetView Entry Panel

1 Confirmation we are at NetView V3 R1.

2 From the main NetView panel we want to look at the hardware alerts.

NPDA

```

N E T V I E W      SESSION DOMAIN: RAN03  PEPE      05/17/95 09:54:40
NPDA-01A           * MENU *
                   * MENU *
                   HOST DOMAIN: RAN03

SEL#  PRODUCES:
( 1)  ( 1)  ( 1)  ALERTS-DYNAMIC DISPLAY
( 2)  ( 2)  ( 2)  TOTAL EVENTS DISPLAY
( 3)  ( 3)  ( 3)  TOTAL STATISTICAL DATA DISPLAY
( 4)  ( 4)  ( 4)  HELP MENU DISPLAY

REQUEST DATA FROM NETWORK RESOURCES:
( 5)  ( 5)  ( 5)  SNA CONTROLLERS (CTRL)
( 6)  ( 6)  ( 6)  MODEMS AND ASSOCIATED LINKS (TEST)

DATA TYPES INITIALIZED/PURGED
AL..... (02/23/95)  EV..... (02/23/95)  ST..... (02/23/95)

ENTER SEL#      SEL#      SEL#

???
CMD==> 2 1

```

Figure 374. Main NPDA Entry panel

1 From here we want to look at the TOTAL EVENTS Display.

NPDA Totals

```

N E T V I E W      SESSION DOMAIN: RAN03  PEPE      05/17/95 10:03:27
NPDA-40A           * TOTAL EVENTS *
                   * TOTAL EVENTS *
                   PAGE 1 OF 5

RAN03

DOMAIN  +-----+      +-----+      +-----+
        |         |      |         |      |         |
        +-----+      +-----+      +-----+

***** RESOURCE EVENTS *****
***** ATTACHED RESOURCES EV *****
SEL# TYPE RESNAME TOTAL FROM TO TOTAL TO
( 1) ( 1) ( 1) APPL RA3AOPC 7 03/21 15:10 03/22 17:44 0 0
( 2) ( 2) ( 2) APPL RA3NETV 2 03/10 16:56 03/10 16:58 0 0
( 3) ( 3) ( 3) APPL RA3OPC 14 03/06 18:23 03/14 21:59 0 0
( 4) ( 4) ( 4) COMC RA3CRACK 0 00/00 00:00 00/00 00:00 12 0
( 5) ( 5) ( 5) COMC RA3P42 0 00/00 00:00 00/00 00:00 48 0
( 6) ( 6) ( 6) COMC RA5NCKH 5 03/07 09:52 04/21 14:38 230 0
( 7) ( 7) ( 7) CP CM41992 1 00/00 00:00 00/00 00:00 1 0
( 8) ( 8) ( 8) CP CP31743 2 05/16 08:25 05/16 09:05 0 0
( 9) ( 9) ( 9) CP RA3 0 00/00 00:00 00/00 00:00 1 0
(10) (10) (10) CPU CPU21009 0 00/00 00:00 00/00 00:00 21 0
(11) (11) (11) CTRL RA$BFO 2 02/27 15:39 02/27 15:47 0 0
ENTER ST (STAT), OR SEL# PLU, M (MOST RECENT)

???
CMD==>

```

Figure 375. Total Events NPDA Panel

1 We can see from here that we are getting alerts from our PC behind the 3174 to our focal point.

2 We also see that we are getting alerts from our 3174 to our focal point NetView.

Dynamic Alerts Display

```

N E T V I E W      SESSION DOMAIN: RAN03   PEPE      05/17/95 09:05:12
NPDA-30B           * ALERTS-STATIC *

                                * ALERTS-STATIC *

SEL# DOMAIN RESNAME TYPE TIME  ALERT DESCRIPTION PROBABLE CAUSE
( 1) RAN03@CM41992 2 CP 08:27 LINK ERROR LAN LLC COMMUNICATIONS/REMOTE NODE
( 2) RAN03@CM41992  CP 08:26 LINK ERROR LAN LLC COMMUNICATIONS/REMOTE NODE
( 3) RAN03 OPCC     PROG 18:28 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 4) RAN03 OPCC     PROG 18:28 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 5) RAN03 OPCC     PROG 18:28 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 6) RAN03 OPCC     PROG 18:27 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 7) RAN03 OPCC     PROG 18:27 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 8) RAN03 OPCC     PROG 18:27 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
( 9) RAN03 OPCC     PROG 18:27 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(10) RAN03 OPCC     PROG 18:26 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(11) RAN03 OPCC     PROG 18:26 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(12) RAN03 OPCC     PROG 18:26 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(13) RAN03 OPCC     PROG 18:26 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(14) RAN03 OPCC     PROG 18:25 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
(15) RAN03 OPCC     PROG 18:25 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM

1
DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER ATO VIEW ALERTS-HISTORY
ENTER SEL#          SEL#M          SEL# (ACTION),OR SEL#          M (MOST RECENT), P
???
CMD==> 1

```

Figure 376. Display from 3174 CP31743

1 The @ in this column is used as an indicator on an alert to show that it has been forwarded over the MDS Transport from another node.

The @ follows the domain name.

2 In this example we see an alert from our PC (CM41992) has reached our focal point over the MDS Transport.

```

N E T V I E W      SESSION DOMAIN: RAN03   PEPE      05/17/95 09:05:12
NPDA-30B           * ALERTS-STATIC *

                                * ALERTS-STATIC *

SEL# DOMAIN RESNAME TYPE TIME  ALERT DESCRIPTION PROBABLE CAUSE
( 1) RAN03@CM41992  CP  08:27 LINK ERROR LAN LLC COMMUNICATIONS/REMOTE NODE
( 2) RAN03@CM41992  CP  08:26 LINK ERROR LAN LLC COMMUNICATIONS/REMOTE NODE
( 3) RAN03 OPCC     PROG 18:28 SW PROGRAM ABNORM TERM:APPLICATION PROGRAM
DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER ATO VIEW ALERTS-HISTORY
ENTER SEL#          SEL#M          SEL# (ACTION),OR SEL#          M (MOST RECENT), P
2 BNH092I ALERT WAS FORWARDED FROM NODE *USIBMRA.CP31743 VIA SNA-MDS.
???
CMD==> 1 q 1

```

Figure 377. Confirmation of Where MDS Alert Came From

1 If you type the selection number and a Q you will be able to find out who sent the alert.

2 This is where the display from the Q command is placed; in this case the alert was forwarded over the MDS Transport from our 3174.

Detailed Alert Display

```

N E T V I E W          SESSION DOMAIN: RAN03  PEPE      05/17/95 09:06:20
NPDA-45A                * RECOMMENDED ACTION FOR SELECTED EVENT *
                        * RECOMMENDED ACTION FOR SELECTED EVENT *    PAGE 1 OF 1

RAN03      31743      CM41992
      -----+-----+
DOMAIN    ( LAN )---| CP |
      -----+-----+

USER      CAUSED - NONE

INSTALL CAUSED - NONE

FAILURE CAUSED - LAN LLC COMMUNICATIONS/REMOTE NODE
              POLL COUNT EXHAUSTED
ACTIONS - I145 - IF PROBLEM PERSISTS THEN DO THE FOLLOWING
              I120 - REVIEW LINK DETAILED DATA
              I176 - CONTACT LAN ADMINISTRATOR RESPONSIBLE FOR THIS LAN
              I142 - REPORT THE FOLLOWING:
                      ADAPTER NUMBER 935112
                      REFERENCE CODE 583,1531 1

ENTER DM      DM      DM (DETAIL MENU) OR D

???
CMD==> d

```

Figure 378. Detailed Display of Alert

1 From this detailed display we can get much more information about the alert.

In this case we see the reference code which we see also in the 3174 status log.

Detailed Alert

```

N E T V I E W          SESSION DOMAIN: RAN03  PEPE      05/17/95 09:07:07
NPDA-43S                * EVENT DETAIL *
                        * EVENT DETAIL *    PAGE 1 OF 1

RAN03      31743      CM41992
      -----+-----+
DOMAIN    ( LAN )---| CP |
      -----+-----+

DATE/TIME: RECORDED - 05/17 08:27

EVENT TYPE: PERMANENT

DESCRIPTION: LINK ERROR

PROBABLE CAUSES:
      LAN LLC COMMUNICATIONS/REMOTE NODE

UNIQUE ALERT IDENTIFIER: PRODUCT ID - 3174      ALERT ID - 5B8F5BA7

ENTER A      A      A (ACTION) OR DM      DM

???
CMD==>

```

Figure 379. Event Detail Display

19.5.4 3174 Status Log

```

_____ Log Records - All _____

(Relative Day/Time since last POR: 019/10:04)
Day Time SC QA PHG_PN CHG_PN ID HA Extended data bytes (B1-B16)
      B1 B3 B5 B7 B9 B11 B13 B15
019 09:30 0583 15 31 1 1A 6040 0031 7419 9204 0401 0140
019 09:29 0583 15 31 1B 6040 0031 7419 9204 0801 0140
019 09:24 0412 03 17 1B 011
019 09:24 0412 03 17 1B 010
019 09:24 0412 03 17 1B 011
019 09:24 0412 03 17 1B 010
019 09:24 0500 01 17 1B
019 09:24 0500 01 17
019 09:24 0505 10 17 1B
019 09:22 0412 03 17 1A 011
019 09:22 0412 03 17 1A 010

PHG_PN=PrimaryHG_PN HG=Hardware Group SC=Status Code ID=Host ID
CHG_PN=ConnectionHG_PN PN=Port Number QA=Qualifier HA=Host Address

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 380. Correlating Alert to 3174 Status Log

1 Looking in the 3174 status log we see what the alert was and some further details if required to resolve the cause.

19.5.5 VTAM Display

```

NCCF                      N E T V I E W   RAN03 PEPE   05/17/95 09:13:30
C RAN03    DISPLAY NET,ID=RAN03,SCOPE=ALL
  RAN03    IST097I DISPLAY ACCEPTED
' RAN03
IST075I NAME = USIBMRA.RAN03 , TYPE = APPL
IST486I STATUS= ACT/S , DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = CDSERVER
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST861I MODETAB=AMODETAB USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=DSIL6MOD USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I APPL MAJOR NODE = RA3AAON
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST271I JOBNAME = NETVIEW , STEPNAME = NETVIEW , DSPNAME = IST8CDD9
IST1050I MAXIMUM COMPRESSION LEVEL - INPUT = 0 , OUTPUT = 0
IST171I ACTIVE SESSIONS = 0000000002, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME STATUS SID SEND RECV VR TP NETID
IST635I CP31743 ACTIV-P EE4B78FF1B30CAF9 0000 000F 0 0 USIBMRA
IST635I CP31743 ACTIV-P EE4B78FF1B30CAF8 0003 0016 0 0 USIBMRA
IST314I END
???
```

Figure 381. Displaying VTAM NetView LU on RA3

Displaying the LU on RA3 we see that the LU for NetView is active.

19.6 APPN Focal Point Management Services to VTAM CPNAME

In this scenario we use Configuration Support-C Release 6 to show how to set up for an APPN focal point on another host in the same APPN network. We point to the VTAM CPNAME in this scenario.

19.7 Configuration

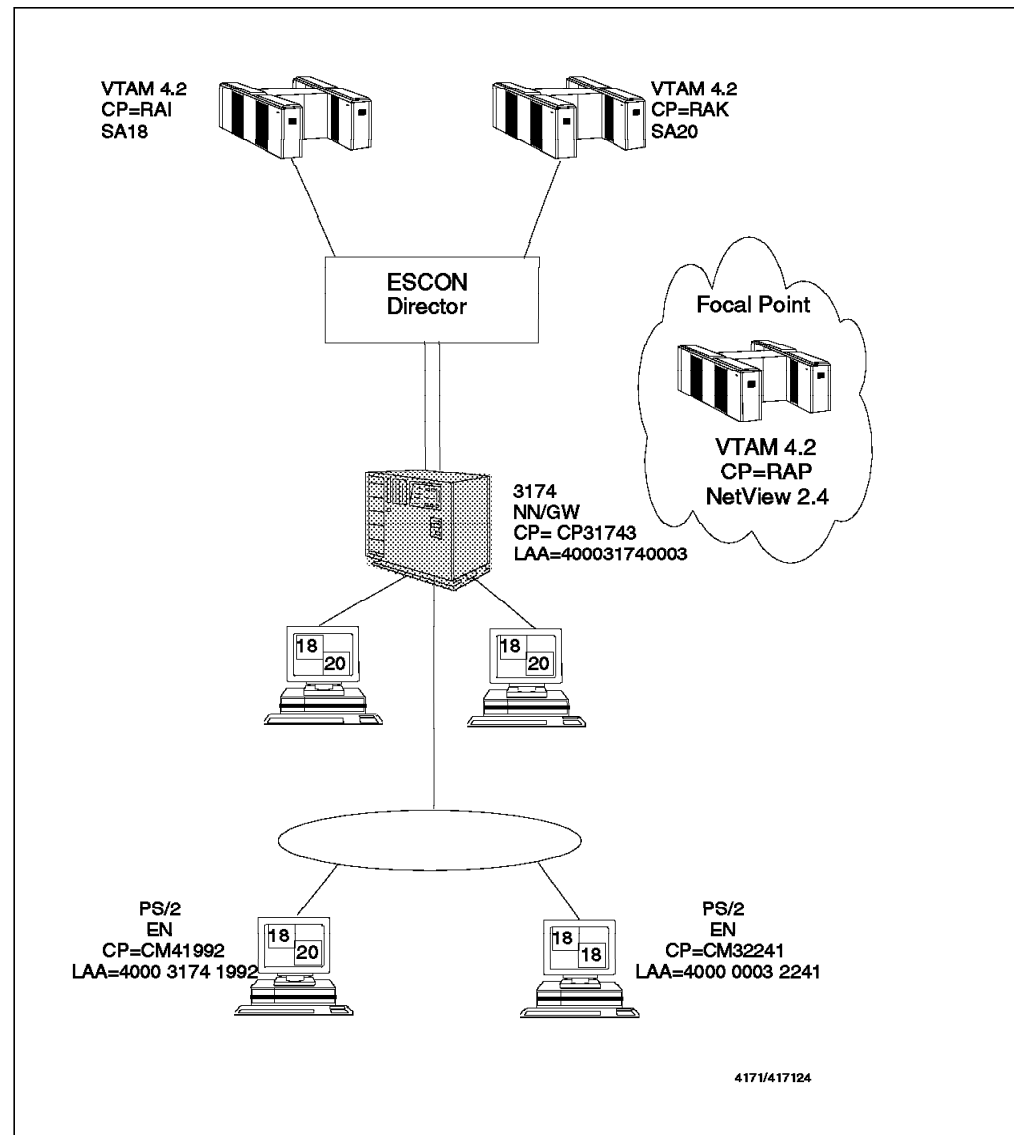


Figure 382. Scenario Configuration

19.8 Definition Overview

This scenario shows how to configure the 3174 to send alert data to our VTAM focal point. We use the same 3174 customizing data we used in Chapter 18, “APPN over 3174 ESCON Channel Connection” on page 297. For this scenario we only show any changes we made in the 3174 and any differences in the 3174 Online Test displays.

The composite network has the same components as the previous scenario 19.3, “APPN Focal Point Management Services to NetView LU” on page 323. See the definitions in 19.5, “Definition Overview” on page 324.

For the Focal Point Host we use:

- S/370 host with VTAM V4.R2
- NetView V2.R4
- VTAM CPNAME RAP

19.8.1 3174-12L Customization

APPN Definition Panel

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 4
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point(614-615)
614 FP NAME - RAP 1      615 FP NETID - USIBMRA 2

Report to Alert Focal Point(616)
616 HOST LINKS - 1A 1B 3 _ _ _ _ _

DLUS Primary Host Name(620-621)
620 CPNAME -              621 NETID - USIBMRA

DLUS Backup Host Name(622-623)
622 CPNAME -              623 NETID -

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 383. Adding Focal Point NAME and NETID

1 In this case we use the CP name for VTAM on system RAP to send the alerts.

The session end point of the MS transport can be moved from the NetView, as an LU, to VTAM, as a control point. This consolidates the MS transport sessions to VTAM CP when VTAM is an APPN NN. It also enables end nodes that are being served by the VTAM NN to find out about their domain focal point and forward data to the focal point through their serving NN.

Use the VTAMCP USE=YES NetView definition statement in DSIDMN to specify that NetView MS transport use the VTAM CP to send and receive data.

This function requires VTAM V4R1 and NetView V2R4 for the focal point enhancements. NetView can still be the session send point of the MS transport in V2R4, even if it is running on a VTAM V4R1 node. Existing applications do not need to be modified if you wish to continue to use the existing MS transport functions.

2 NETID of the Focal Point Alert monitor.

3 Send all alerts generated for both hosts to the Focal Point.

19.8.2 Online Tests

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
CF2FAC3075F721D4	USIBMRA	CM41992	ACTIVE	02	CPSVCMG	CM41992
EE4B78FF1D096A15	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM41992
EEFFC38B9977B487	USIBMRA	CM32241	ACTIVE	02	CPSVCMG	CM32241
EE4B78FF1D096A16	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM32241
EE4B78FF1D096A56	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAI
F86FE164D92439B7	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI
EE4B78FF1D096A57	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAK
F8D3D1649803577F	USIBMRA	RAK	ACTIVE	02	CPSVCMG	RAK
EE4B78FF1D096A58	USIBMRA	CP31743	ACTIVE	02	SNASVCMG	RAP 1
EE4B78FF1D096A59	USIBMRA	CP31743	ACTIVE	02	SNASVCMG	RAP 2

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 384. Online Test Panel /17,7

1 From this display on the 3174 we can see that we have some active LU6.2 sessions from the 3174 CP (CP31743) to the VTAM CP (RAP).

2 We are using Mode SNASVCMG which is used for CNOS and management services sessions.

19.8.3 NetView System Displays

```
CNM1NETV          NETVIEW VERSION 2  RELEASE 4  1 MAIN MENU

                OPERATOR ID = PEPE      APPLICATION = RAPAN005

Enter a command (shown highlighted or in white) and press Enter.

Browse Facility      BROWSE
Command Facility     NCCF
Help Desk Facility   HELPDESK
Hardware Monitor     NPDA
4700 Support Facility TARA
Session Monitor      NLDM
Status Monitor       STATMON

News                 NEWS
PF Key Settings      DISPFK

To Exit the NetView Program  LOGOFF

CMD==> NPDA  2
```

Figure 385. Main NetView Entry Panel

1 Confirmation we are at NetView V2 R4.

2 From the main NetView panel we want to look at the hardware alerts.

NPDA

```
NETVIEW          SESSION DOMAIN: RAPAN  PEPE  05/19/95 10:48:18
NPDA-01A          * MENU *
                  * MENU *          HOST DOMAIN: RAPAN

SEL#  PRODUCES:
( 1)  ( 1)  ( 1)  ALERTS-DYNAMIC DISPLAY
( 2)  ( 2)  ( 2)  TOTAL EVENTS DISPLAY
( 3)  ( 3)  ( 3)  TOTAL STATISTICAL DATA DISPLAY
( 4)  ( 4)  ( 4)  HELP MENU DISPLAY

REQUEST DATA FROM NETWORK RESOURCES:
( 5)  ( 5)  ( 5)  SNA CONTROLLERS (CTRL)
( 6)  ( 6)  ( 6)  MODEMS AND ASSOCIATED LINKS (TEST)

DATA TYPES INITIALIZED/PURGED
AL..... (04/13/95)  EV..... (04/13/95)  ST..... (04/13/95)

ENTER SEL#      SEL#      SEL#

???
CMD==> 2  1
```

Figure 386. Main NPDA Entry Panel

1 From here we want to look at the TOTAL EVENTS display.

NPDA Totals

N E T V I E W		SESSION DOMAIN: RAPAN		PEPE	05/19/95 10:49:15	
NPDA-40A		* TOTAL EVENTS *				
		* TOTAL EVENTS *		PAGE	1 OF 2	
RAPAN						
DOMAIN	+-----+	+-----+	+-----+			
	+-----+	+-----+	+-----+			
***** RESOURCE EVENTS *****						
SEL#	TYPE	RESNAME	TOTAL	FROM	TO	ATTACHED RESOURCES EV
(1) (1) (1)				10	05/19 10:34	05/19 10:39
(2) (2) (2)	COMC	NCP_NAME		0	00/00 00:00	00/00 00:00
(3) (3) (3)	COMC	RA5NCKH		0	00/00 00:00	00/00 00:00
(4) (4) (4)	COMC	RA5NCP1	16	04/18 14:01	05/17 16:27	139 0
(5) (5) (5)	COMC	RA7NCPX	25	05/03 09:26	05/18 17:16	275 0
(6) (6) (6)	CP	CP31743 1	4	05/19 10:39	05/19 10:45	
(7) (7) (7)	CP	Q4D2252Y	0	00/00 00:00	00/00 00:00	28 0
(8) (8) (8)	CP	RAP	1	05/12 22:18	05/12 22:18	0 0
(9) (9) (9)	CP	RA6002CP	0	00/00 00:00	00/00 00:00	1 0
(10) (10) (10)	CP	RA6003CP	0	00/00 00:00	00/00 00:00	11 0
(11) (11) (11)	CP	RA6012CP	0	00/00 00:00	00/00 00:00	3 0
ENTER ST	ST	ST (STAT), OR SEL#	SEL#	SEL# PLU		
???						
CMD==> 6						

Figure 387. Total Events NPDA Panel

1 From this display we can see that we are getting alerts being forwarded to this Focal Point from the 3174 CP31743.

Most Recent Alerts Display

N E T V I E W		SESSION DOMAIN: RAPAN		PEPE	05/19/95 10:50:19	
NPDA-41A		* MOST RECENT EVENTS *				
		* MOST RECENT EVENTS *		PAGE	1 OF 3	
RAPAN CP31743 1						
DOMAIN	+-----+					
	CP					
	+-----+					
SEL#	DATE/TIME	EVENT DESCRIPTION	PROBABLE CAUSE	ETYP		
(1) (1) (1)	05/18 13:09	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(2) (2) (2)	05/18 13:09	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(3) (3) (3)	05/18 13:03	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(4) (4) (4)	05/18 13:03	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(5) (5) (5)	05/18 12:56	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(6) (6) (6)	05/18 12:56	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(7) (7) (7)	05/18 12:49	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(8) (8) (8)	05/18 12:49	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(9) (9) (9)	05/18 12:46	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(10) (10) (10)	05/18 12:46	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(11) (11) (11)	05/18 12:42	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
(12) (12) (12)	05/18 12:42	DIR SERVICES	PROTOCOL ERR COMM PGM	REMOTE NODE		
ENTER SEL#	SEL#	SEL# (ACTION) OR SEL#	SEL			
???						
CMD==> 1						

Figure 388. Most Recent Events Panel

1 From this display we can see all the alerts that have been forwarded from the 3174. We take a look at a specific entry; in this case, the first one.

Detailed Alert Display

```

N E T V I E W      SESSION DOMAIN: RAPAN   PEPE      05/19/95 10:51:01
NPDA-45A          * RECOMMENDED ACTION FOR SELECTED EVENT *
                  * RECOMMENDED ACTION FOR SELECTED EVENT *    PAGE 1 OF 1
    RAPAN          CP31743
                  +-----+
    DOMAIN         |  CP  |
                  +-----+

USER      CAUSED - NONE

INSTALL CAUSED - NONE

FAILURE CAUSED - DIRECTORY PROGRAM REMOTE NODE
ACTIONS - I126 - CONTACT APPROPRIATE SERVICE REPRESENTATIVE
          I142 - REPORT THE FOLLOWING:
                  SNA SENSE DATA 1010A002
                  PRODUCT ALERT REFERENCE CODE 855,0600 1

ENTER DM      DM      DM (DETAIL MENU) OR D

???
CMD==> D

```

Figure 389. Detailed Display of Alert

1 From the detailed display we can get more information for this alert by typing a D.

In this case, we see later that this alert is also logged on the 3174 status log.

Detailed Alert

```

N E T V I E W      SESSION DOMAIN: RAPAN   PEPE      05/19/95 10:52:06
NPDA-43S          * EVENT DETAIL *
                  * EVENT DETAIL *    PAGE 1 OF 2
    RAPAN          CP31743
                  +-----+
    DOMAIN         |  CP  |
                  +-----+

SEL# TYPE AND NAME OF OTHER RESOURCES ASSOCIATED WITH THIS EVENT:
( 1) ( 1) ( 1) CP      RAI

DATE/TIME: RECORDED - 05/18 13:09

EVENT TYPE: PERMANENT

DESCRIPTION: DIRECTORY SERVICES PROTOCOL ERROR

PROBABLE CAUSES:
    COMMUNICATIONS PROGRAM IN REMOTE NODE

ENTER A      A      A (ACTION), SEL#      SEL#

???
CMD==> PF3 to main NPDA menu

```

Figure 390. Event Detail Alert

Dynamic Detail Alerts

```

N E T V I E W          SESSION DOMAIN: RAPAN   PEPE      05/19/95 10:53:18
NPDA-30B                * ALERTS-STATIC *
                        * ALERTS-STATIC *

SEL# DOMAIN RESNAME TYPE TIME ALERT DESCRIPTION PROBABLE CAUSE
( 1) RAPAN CP31743 1 CP 10:53 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 2) RAPAN CP31743 CP 10:53 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 3) RAPAN CP31743 CP 10:49 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 4) RAPAN CP31743 CP 10:49 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 5) RAPAN CP31743 CP 10:45 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 6) RAPAN CP31743 CP 10:45 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 7) RAPAN CP31743 CP 10:39 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 8) RAPAN CP31743 CP 10:39 DIR SERVICES PROTOCOL ERR COMM PGM REMOTE NODE
( 9) RAPAN 9_170_3 DEV 23:01 NO COMM WITH REMOTE NODE COMM/REMOTE NODE
(10) RAPAN 9_170_3 DEV 23:01 NO COMM WITH REMOTE NODE COMMUNICATIONS INTF
(11) RAPAN 9_170_3 DEV 22:59 NO COMM WITH REMOTE NODE COMM/REMOTE NODE
(12) RAPAN 9_170_3 DEV 22:59 NO COMM WITH REMOTE NODE COMMUNICATIONS INTF
(13) RAPAN 9_170_3 DEV 22:56 NO COMM WITH REMOTE NODE COMM/REMOTE NODE
(14) RAPAN 9_170_3 DEV 22:56 NO COMM WITH REMOTE NODE COMMUNICATIONS INTF
(15) RAPAN 9_170_3 DEV 22:55 SNMP RESOURCE PROBLEM:UNDETERMINED
DEPRESS ENTER KEY TO VIEW ALERTS-DYNAMIC OR ENTER ATO VIEW ALERTS-HISTORY
ENTER SEL#          SEL#          SEL# (ACTION),OR SEL#

???
CMD==> 1

```

Figure 391. ALERTS-DYNAMIC DISPLAY from Main NPDA Options Panel

1 From the ALERTS-DYNAMIC DISPLAY option we can get to this panel to see who is generating alerts. We can see the 3174 Control Point is generating CP alerts and forwarding them to this Focal Point host.

We look at the latest alert and see what info is available.

Detailed Alert

```

N E T V I E W          SESSION DOMAIN: RAPAN   PEPE      05/19/95 10:54:00
NPDA-45A                * RECOMMENDED ACTION FOR SELECTED EVENT *
                        * RECOMMENDED ACTION FOR SELECTED EVENT *   PAGE 1 OF 1

RAPAN                  CP31743
+-----+
DOMAIN | CP |
+-----+

USER      CAUSED - NONE

INSTALL CAUSED - NONE

FAILURE CAUSED - DIRECTORY PROGRAM REMOTE NODE
ACTIONS - I126 - CONTACT APPROPRIATE SERVICE REPRESENTATIVE
          I142 - REPORT THE FOLLOWING:
                  SNA SENSE DATA 1010A002
                  PRODUCT ALERT REFERENCE CODE 855,0600 1

ENTER DM      DM      DM (DETAIL MENU) OR D

???
CMD==>

```

Figure 392. Recommended Actions Display

1 As from the TOTAL ALERTS display we can get the same data that we saw previously.

19.8.4 3174 Status Log

```

_____ Log Records - All _____

(Relative Day/Time since last POR: 021/11:00)
Day Time SC QA PHG_PN CHG_PN ID HA Extended data bytes (B1-B16)
      B1 B3 B5 B7 B9 B11 B13 B15

021 10:55 0855 06 00 1          1010 A002 RAI
021 10:55 0855 06 00          1010 A002 RAI
021 10:52 0855 06 00          1010 A002 RAI
021 10:52 0855 06 00          1010 A002 RAI
021 10:48 0855 06 00          1010 A002 RAI
021 10:48 0855 06 00          1010 A002 RAI
021 10:41 0855 06 00          1010 A002 RAI
021 10:41 0855 06 00          1010 A002 RAI
021 10:36 0412 03 17          1B 011
021 10:36 0412 03 17          1B 010
021 10:35 0412 03 17          1B 011

PHG_PN=PrimaryHG_PN    HG=Hardware Group  SC=Status Code  ID=Host ID
CHG_PN=ConnectionHG_PN PN=Port Number    QA=Qualifier    HA=Host Address

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu

```

Figure 393. Correlating Alert to 3174 Status Log

1 Looking in the 3174 status log we see what the alert was and some further details if required to resolve this hardware alert.

19.8.5 VTAM Displays

```

NCCF                      N E T V I E W    RAPAN PEPE    05/19/95 10:46:07
C RAPAN    DISPLAY NET,ID=CP31743,SCOPE=ALL
  RAPAN    IST097I DISPLAY ACCEPTED
' RAPAN
IST075I NAME = USIBMRA.CP31743 , TYPE = CDRSC
IST486I STATUS= ACT/S---Y, DESIRED STATE= ACTIV
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST1333I ADJLIST = ***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=***NA*** USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I CDRSC MAJOR NODE = ISTCDRDY
IST479I CDRM NAME = RAP , VERIFY OWNER = NO
IST1184I CPNAME = USIBMRA.CP31743 - NETSRVR = ***NA***
IST1131I DEVICE = ILU/CDRSC
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST171I ACTIVE SESSIONS = 0000000002, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME STATUS SID SEND RECV VR TP NETID
IST635I RAP 1 ACTIV-S EE4B78FF1D096A59 0014 0000 0 0 USIBMRA
IST635I RAP ACTIV-S EE4B78FF1D096A58 0010 0003 0 0 USIBMRA
IST314I END
???
```

Figure 394. CP31743 Status with VTAM Host RAP

1 From this display of CP31733 on host RAP we see that there are two LU6.2 sessions with the 3174 Control Point, and they are both active.

RAP CP Host Status

```

NCCF                                N E T V I E W    RAPAN PEPE    05/19/95 10:44:25

C RAPAN    DISPLAY NET,ID=RAP,SCOPE=ALL
  RAPAN    IST097I DISPLAY ACCEPTED
' RAPAN
IST075I NAME = USIBMRA.RAP      , TYPE = CDRM
IST1046I CP      USIBMRA.RAP      ALSO EXISTS
IST486I STATUS= ACTIV      , DESIRED STATE= ACTIV
IST815I AUTOMATIC RECOVERY IS SUPPORTED
IST231I CDRM      MAJOR NODE = VTAMSEG
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST476I CDRM TYPE =      HOST, GATEWAY CAPABLE
IST637I SUBAREA=      25 ELEMENT= 1
IST388I DYNAMIC CDRSC DEFINITION SUPPORT = YES
IST171I ACTIVE SESSIONS = 0000000006, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME      STATUS      SID      SEND RECV VR TP NETID
IST635I RA3      ACTIV      F88F0164A2798FFA      0 2 USIBMRA
IST635I RA1      ACTIV      F88F0164A2799002      0 2 USIBMRA
IST635I RA36     ACTIV      F707BB8486673536      0 2 USIBMRA
IST635I RAI      ACTIV      F88F0164A2798FFE      0 2 USIBMRA
IST635I RAK      ACTIV      F88F0164A2798FFC      0 2 USIBMRA
IST635I RAB      ACTIV      F88F0164A2798FFB      0 2 USIBMRA
IST075I NAME = USIBMRA.RAP      , TYPE = CDRM
IST924I -----
IST075I NAME = USIBMRA.RAP      , TYPE = HOST CP
IST1046I SSCP      USIBMRA.RAP      ALSO EXISTS
IST486I STATUS= ACT/S      , DESIRED STATE= ACTIV
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=***NA*** USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED ,SLU ENABLED ,SESSION LIMIT NONE
IST231I APPL      MAJOR NODE = VTAMSEG
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST271I JOBNAME = NET25      , STEPNAME = NET25      , DSPNAME = IST7D246
IST1050I MAXIMUM COMPRESSION LEVEL - INPUT = 0      , OUTPUT = 0
IST171I ACTIVE SESSIONS = 0000000008, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST634I NAME      STATUS      SID      SEND RECV VR TP NETID
IST635I RA1      ACTIV/CP-S F88F0164A279900D 0589 0001 0 0 USIBMRA
IST635I RAI      ACTIV/CP-S F88F0164A279900B 05BF 0001 0 0 USIBMRA
IST635I RAB      ACTIV/CP-S F88F0164A2799008 1326 0001 0 0 USIBMRA
IST635I CP31743 1 ACTIV-P      EE4B78FF1D096A59 0000 0011 0 0 USIBMRA
IST635I CP31743 ACTIV-P      EE4B78FF1D096A58 0003 000E 0 0 USIBMRA
IST635I RA1      ACTIV/CP-P F71B61647386E8E2 0001 05D5 0 0 USIBMRA
IST635I RAI      ACTIV/CP-P F86FE164D9242DE0 0001 05C8 0 0 USIBMRA
IST635I RAB      ACTIV/CP-P F7EFD164D29E01E4 0001 1361 0 0 USIBMRA
IST314I END
-----
???
```

Figure 395. RAP Host Status

1 From this display of CP name RAP we see that there are two LU6.2 sessions with the 3174 Control Point CP31743. RAP is the secondary in this case and the CP31743 is the primary for these two active sessions.

19.9 APPN Focal Point Management Services to AS/400

In this scenario we use Configuration Support-C Release 6 to show how to set up for an APPN focal point on another host in the same APPN network. We point to the AS/400 in this scenario.

19.10 Configuration

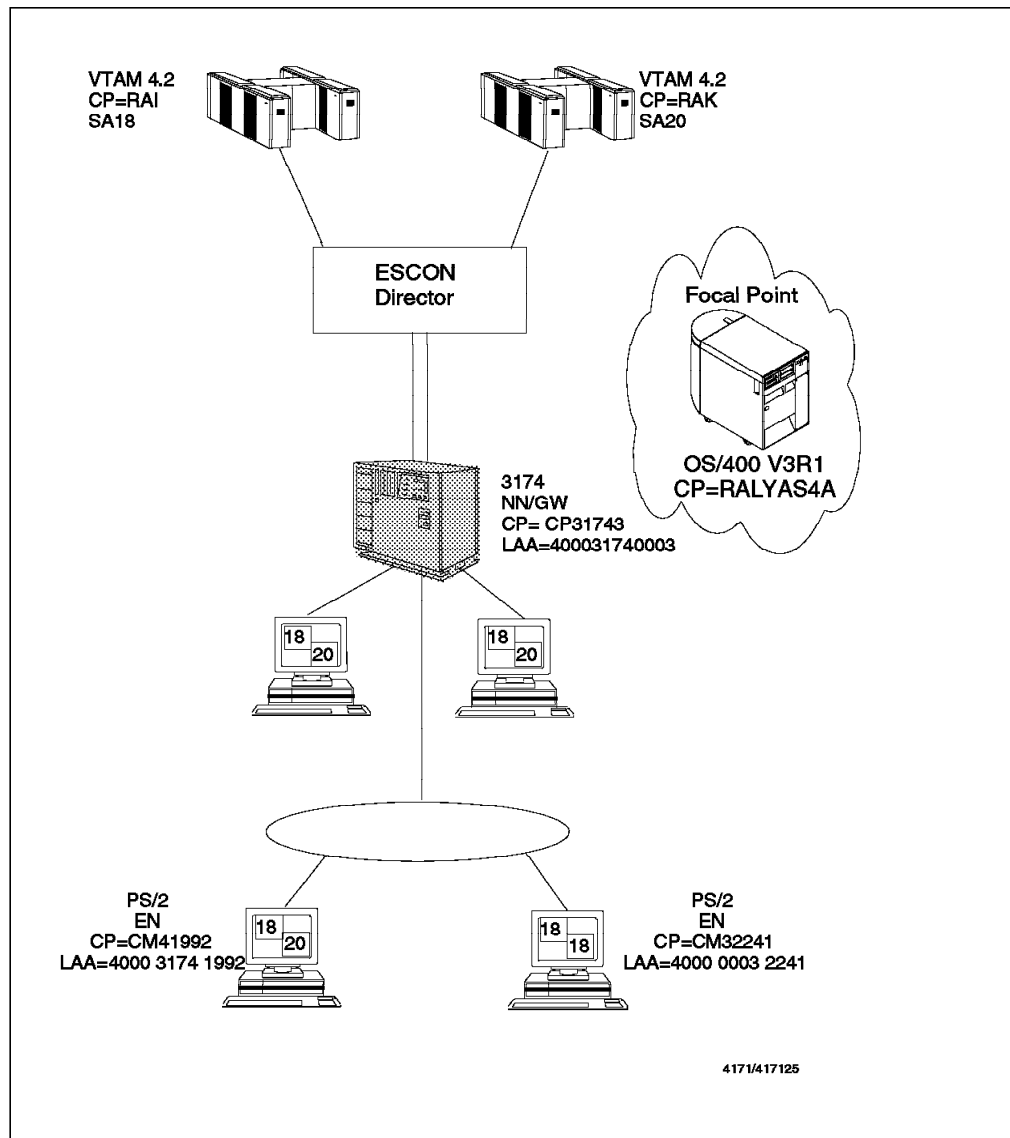


Figure 396. Scenario Configuration

19.11 Definition Overview

This scenario shows how to configure the 3174 to send alert data to our VTAM Focal point. We use the same 3174 customizing data we used in Chapter 18, “APPN over 3174 ESCON Channel Connection” on page 297. For this scenario we only show any changes we made in the 3174 and any differences in the 3174 Online Test displays.

The composite network has the same components that were defined in scenario 19.3, “APPN Focal Point Management Services to NetView LU” on page 323. See definitions in 19.5, “Definition Overview” on page 324.

For the Focal Point Host we are using:

- AS/400
- OS/400 V3 R1

19.11.1 3174-12L Customization

APPN Definition Panel

```

_____ APPN Node Definition _____

610 SESSIONS - 2          611 NODES/LINKS - 4
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point(614-615)
614 FP NAME - RALYAS4A 1      615 FP NETID - USIBMRA 2

Report to Alert Focal Point(616)
616 HOST LINKS - 1A 1B 3  _ _ _ _ _

DLUS Primary Host Name(620-621)
620 CPNAME -              621 NETID - USIBMRA

DLUS Backup Host Name(622-623)
622 CPNAME -              623 NETID -

Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
```

Figure 397. Adding Focal Point NAME and NETID

1 In this case we are using the CP name for the AS/400 RALYAS4A to send the alerts.

2 NETID of the Focal Point Alert monitor.

3 Send all alerts generated for both hosts to the Focal Point.

19.11.2 Online Tests

Local LU 6.2 Session Status						
PCID	NETID	CPNAME	Status	ST	MODE	PARTNER LU
EEFFC38B9D77B487	USIBMRA	CM32241	ACTIVE	02	CPSVCMG	CM32241
EE4B78FF1EA54272	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	CM32241
EE4B78FF1EA5426E	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAK
F8D3D1649803CC9D	USIBMRA	RAK	ACTIVE	02	CPSVCMG	RAK
EE4B78FF1EA5426F	USIBMRA	CP31743	ACTIVE	02	SNASVCMG	RALYAS4A 1
F64B0D2BCCE79088	USIBMRA	RALYAS4A	ACTIVE	02	SNASVCMG 2	RALYAS4A
EE4B78FF1EA54270	USIBMRA	CP31743	ACTIVE	02	CPSVCMG	RAI
F86FE164DA50AEAD	USIBMRA	RAI	ACTIVE	02	CPSVCMG	RAI

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==>

PF: 3=Quit 5=Refresh 12=Test Menu

Figure 398. Online Test Panel /17,7

1 From this display on the 3174 we can see that we have some active LU6.2 sessions from the 3174 CP to the AS/400 CP name on the system RALYAS4A.

2 We use Mode SNASVCMG which is used for CNOS and management services sessions.

19.11.3 AS/400 System Displays

MAIN	AS/400 Main Menu	SYSTEM: RALYAS4A
Select one of the following:		
1. User tasks		
2. Office tasks		
3. General system tasks		
4. Files, libraries, and folders		
5. Programming		
6. Communications		
7. Define or change the system		
8. Problem handling		
9. Display a menu		
10. Information Assistant options		
11. Client Access tasks		
90. Sign off		
Selection or command		
====> wrkalr 1		
F3=Exit F4=Prompt F9=Retrieve F12=Cancel F13=Information Assistant		
F23=Set initial menu		
(C) COPYRIGHT IBM CORP. 1980, 1994.		

Figure 399. AS/400 Main Menu Display

1 WRKALR brings up the AS/400 alert application.

Working With Alerts

```

Work with Alerts
RALLYAS4A
05/30/95 14:47:10

Type options, press Enter.
2=Change 4=Delete 5=Display recommended actions 6=Print details
8=Display alert detail 9=Work with problem

Resource
Opt Name Type Date Time Alert Description: Probable Cause
CP31743 CP 05/30 13:29 Directory services protocol error: Communi
CP31743 CP 05/30 13:29 Directory services protocol error: Communi
1 8 CP31743 CP 05/30 09:57 Session services protocol error: Communicat
*UNKNOWN UNK 05/30 09:57 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:57 Undetermined error: Undetermined
*UNKNOWN UNK 05/30 09:57 Undetermined error: Undetermined
*UNKNOWN UNK 05/30 09:57 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK 05/30 09:10 SNA protocol error: Application program
More...
F3=Exit F10=Show new alerts F11=Display user/group F12=Cancel
F13=Change attributes F20=Right F21=Automatic refresh F24=More keys

```

Figure 400. Main Alerts Display Panel

1 Let us display the alert detail that has come over from the 3174 CP31743.

Detailed Alert Display

```

Display Alert Detail
RALLYAS4A
05/30/95 14:47:10

-----Resource Hierarchy-----
Resource Name Resource Type
CP31743 CP

Logged date/time . . . . . : 05/30/95 09:57:35
Problem date/time . . . . . : 05/30/95 09:57:35
User assigned . . . . . :
Group assigned . . . . . : *DEFAULT
Filter . . . . . : AS400NET
Library . . . . . : QALSND
Alert type . . . . . : Permanent
Alert description . . . . . : Session services protocol error
Probable cause . . . . . : Communications program in remote node
More...

Press Enter to continue. 1

F3=Exit F11=Display detail menu F12=Cancel F18=Display actions

```

Figure 401. First page of Detailed Alert

1 At this point we press PageDown as there is more data to display.

Detailed Alert Display

```

                                Display Alert Detail                                RALYAS4A
                                05/30/95 14:47:10
-----Resource Hierarchy-----
Resource Name      Resource Type
CP31743            CP

Unique alert identifier:
Product ID . . . . . : 3174
Alert ID number . . . . : 2174 5F28

                                                                    Bottom

Press Enter to continue.

F3=Exit  F11=Display detail menu  F12=Cancel  F18=Display actions

```

Figure 402. Second Page of Detailed Alert

Main Panel to Display Recommended Actions

```

                                Work with Alerts                                RALYAS4A
                                05/30/95 14:47:10
Type options, press Enter.
2=Change  4=Delete  5=Display recommended actions  6=Print details
8=Display alert detail  9=Work with problem

Resource
Opt  Name  Type  Date  Time  Alert Description: Probable Cause
CP31743  CP   05/30 13:29 Directory services protocol error: Communi
CP31743  CP   05/30 13:29 Directory services protocol error: Communi
1 5 CP31743  CP   05/30 09:57 Session services protocol error: Communicat
*UNKNOWN UNK   05/30 09:57 SNA protocol error: Application program
*UNKNOWN UNK   05/30 09:57 Undetermined error: Undetermined
*UNKNOWN UNK   05/30 09:57 Undetermined error: Undetermined
*UNKNOWN UNK   05/30 09:57 SNA protocol error: Application program
*UNKNOWN UNK   05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK   05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK   05/30 09:10 SNA protocol error: Application program
*UNKNOWN UNK   05/30 09:10 SNA protocol error: Application program
More...
F3=Exit  F10=Show new alerts  F11=Display user/group  F12=Cancel
F13=Change attributes  F20=Right  F21=Automatic refresh  F24=More keys

```

Figure 403. Selecting Recommended Actions

1 Now, let's display the recommended actions for this alert.

Recommended Actions

```

                                Display Recommended Actions
                                05/30/95 14:47:10 RALYAS4A

-----Resource Hierarchy-----
Resource Name      Resource Type
CP31743            CP

Failure causes . . . . : Session services program in remote node
Actions . . . . . : Contact appropriate service representative
                   Report the following
                   SNA sense data 08090039
                   Product alert reference code 854,0100 1

Press Enter to continue.

F3=Exit  F12=Cancel  F17=Display detail
  
```

Figure 404. Recommended Actions Display

1 We see that this code is also logged in the 3174 status log.

19.11.4 3174 Status Log

```

                _____ Log Records - All _____
(Relative Day/Time since last POR: 032/15:09)
Day Time SC  QA PHG_PN CHG_PN ID HA Extended data bytes (B1-B16)
      B1  B3  B5  B7  B9  B11  B13  B15
032 14:32 0855 06 00          1010 A002 RAK
032 13:45 0855 06 00          1010 A002 RAK
032 13:45 0855 06 00          1010 A002 RAK
032 10:13 0854 01 00 1      0809 0039 CM32 241 0009
032 10:13 0436 04 00          0F08 B500 00
032 10:13 0412 03 17          1A 011
032 10:13 0412 03 17          1A 010
032 10:13 0412 03 17          1A 011
032 10:13 0412 03 17          1A 010
032 10:13 0418 08 17      26_01 1A 003
032 10:13 0500 01 17          1A

PHG_PN=PrimaryHG_PN  HG=Hardware Group  SC=Status Code  ID=Host ID
CHG_PN=ConnectionHG_PN  PN=Port Number  QA=Qualifier  HA=Host Address

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==>

PF: 3=Quit 8=Fwd 12=Test Menu
  
```

Figure 405. Correlating Alert to 3174 Status Log

1 Looking in the 3174 status log we see what the alert was and some further details if required to resolve this hardware alert.

Chapter 20. 3174 APPN with Peer Communications and Bridging

With Configuration Support-C Release 6, the Frame Relay Communications feature is extended to provide source-route remote bridging.

The 3174 Bridge implementation, with this new support, combines the two elements of 3174 source-route bridging functions:

- Local bridging for Peer Communication
- Remote bridging over frame relay

The controller must have a 3174 Type 3A Dual Speed (16/4 Mbps) Communication Adapter installed in order to act as a 3174 Source Route Bridge. For remote bridging, the Communication Adapter (CA) (Type 1 or Type 2) is required to provide the connection to a frame relay network.

With the remote SRB support, the 3174 extends its capabilities greatly and becomes a very versatile machine in a multiprotocol network. In an APPN network, the 3174 acting as a network node can have another 3174 NN as its remote bridge partner to bridge APPN traffic.

20.1 Scenario: Bridging between Two 3174s

This is an excerpt from scenario 6 of Redbook *3174 Network Server in Frame Relay and Multiprotocol Networks*, GG24-4376. Please refer to this manual for the complete details. Our goal here is to show that APPN can work over Peer and Bridged Networks.

In this scenario we are showing a local site with the main frame and a token-ring LAN, and a remote location connected via a frame relay network to the main frame. We demonstrate the transition from a routed network to a bridged network. Because bridging is done on the Data Link Layer (2) and routing takes place at the Network Layer (3), there are bound to be major changes in the appearance of the logical network topology. No change is done to the physical layout of the network. The network protocols used are SNA (3270), APPN (LU6.2) and TCP/IP.

This scenario is split into two parts:

1. Part one shows a routed network for SNA, APPN, and TCP/IP.
2. In part two, we see the same network, running the same protocols, but as a bridged network.

20.1.1 Configuration Diagram for Routed Network

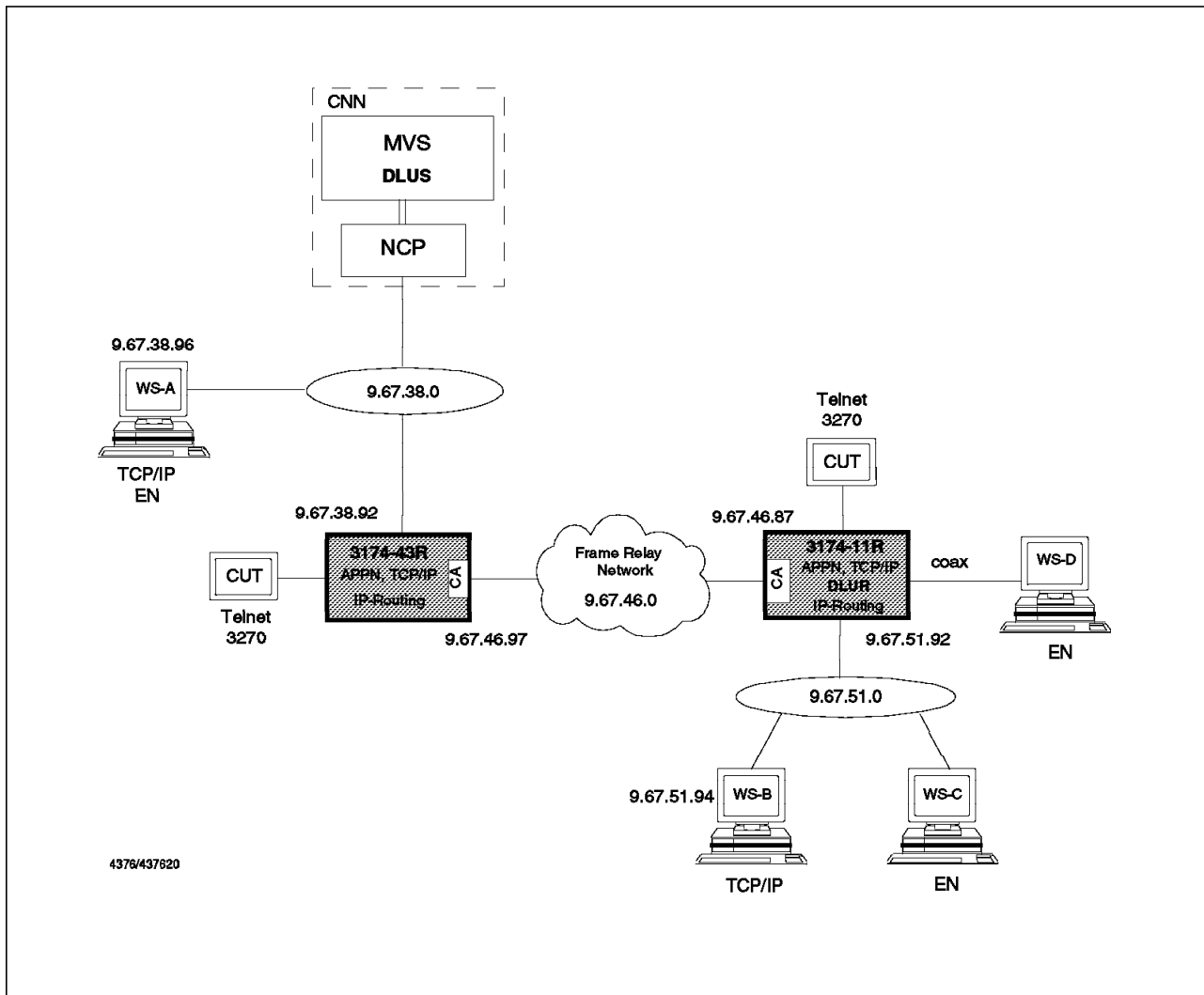


Figure 406. Routing SNA, APPN and TCP/IP Traffic between 3174s

List of CPNAMEs and MAC Addresses used in this Scenario

Machine Type	MAC Address	CPNAME
-----	-----	-----
VTAM/NCP	400001090001	RAI
3174-43R	400031740005	CP31745
3174-11R or 13R	400031740002	CP31742
PS/2 WS-A	400000032241	CM32241
PS/2 WS-B	400031749992	CM49992
PS/2 WS-C	400031741992	CM41992
PS/2 WS-D	400031742992	CM42992

Figure 407. List of CPNAME and MAC Addresses for Scenario 6

20.1.1.1 Configuration Description

This configuration shows two 3174s interconnected over an IDNX frame relay network, with access to a mainframe over a token-ring with NCP as gateway controller.

- Workstation WS-A has APPN and TCP/IP to the NCP token-ring; workstation WS-B has TCP/IP to the 3174 token-ring and workstation WS-D is coax-attached to the 3174-11R.
- Both 3174s have been configured for TCP/IP.
- The 3174-11R was updated to support Peer Communication for WS-D.

The participants of the network are:

- VTAM V4.2 and NCP V7.2 as a Composite Network Node (CNN).
- 3745-170 with NCP V7.2 as token-ring gateway.
- 3174-43R is an 8250 WAN module with a Communication Adapter (CA) for frame relay and a token-ring adapter for the primary host link.
- The 3174-11R with the Communication Adapter (CA) as the primary host link over frame relay. Because this 3174 is not adjacent to the host, DLUR support is required to provide the 3270 host link for the 3174-attached terminals. Gateway support for the downstream workstations is not available because the 3174 DLUR function cannot support downstream PUs. If 3270 host access would be required for them, they would have to establish their own DLUR session to VTAM.
- Workstations WS-A, WS-C and WS-D are OS/2 V2.1 with Communication Manager/2 V1.11 for SNA and APPN, and/or TCP/IP. WS-D is equipped with a 3270 Communication Adapter for Peer Communication with the 3174. WS-B is running DOS/WIN with PC3270 emulation and TCP/IP for DOS.

The following connections and protocols are available:

- 3270 communication
 - The Control Unit Terminals (CUT) in both 3174s have access to 3270 applications on the MVS host.
 - WS-A does not use any 3270 sessions in this part of the scenario.
 - WS-B, -C and -D need DLUR support to have 3270 host access (not tested in this scenario).
- APPN/APPC communication
 - The 3174-11R is the Network Node Server (NNS) for WS-C and WS-D.
 - WS-B is an LEN end node and can use 3174 NN services to participate in the APPN network (not tested in this scenario).
 - The 3174-43R is the NNS for WS-A.
 - All workstations tested have APPC communication with each other and with MVS.

20.1.2 3174 Customization

Defining the 3174-11R Peer Communication:

Workstation-D (WS-D) is coax-attached and requires the 3174 Peer Communication function. Configuration starts at the Customize Control Disk Menu panel, Selection 8: Define 3174-Peer and Bridges, which leads you to the first customization panel shown below.

```

_____ 3174 Peer and Bridges Menu _____

Select Option; press ENTER

Option      Description
-----
  1         Define 3174-Peer and Bridges
  2         Define Bridge Filters

Select ==> 1

PF: 3=Quit                                12=Done

```

Figure 408. 3174 Peer and Bridges Menu Panel

3174 Peer and Bridges Options

```

_____ 3174 Peer and Bridges Options _____

650 - Y 1 Define 3174-Peer Support Y,N

656 - 0 2 Multiport Bridging      0 = None
                                      1 = Source Route Bridging

PF: 3=Quit    4=Default    8=Fwd

```

Figure 409. Selection for 3174 Peer and Source Route Remote Bridging

1 Answer YES to configure Peer Communication and include initialization when the controller is IMLed.

2 Peer Communication is only local bridging between two ports (Workstation Adapter and Token-Ring Adapter). Multiport Bridging includes Source Route Remote Bridging over frame relay.

3174-Peer Bridge Definition

3174-Peer Definition

3174-Peer Options

1	651 - Y	3174-Peer Bridge Support	Y,N
----------	---------	--------------------------	-----

3174-Peer Station Parameters

2	660 - 4000 3174 2F PN	3174-Peer Port Address Range	0000 00 - FFFF FF
	661 - 05	Percentage of Discard Threshold	00 - 99

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 410. 3174 Peer Definition Panel

1 Peer Bridge support needs to be selected if you want the Peer Devices to communicate to any device on the 3174 token-ring. If Peer Devices just communicate between each other and the host, then the bridge to the token-ring is not required.

2 For Peer Devices, MAC address digits 1-4 is hard coded and cannot be changed. Digit 5-10 (in our example: 3174 2F) is user-defined. Digits 11 and 12 (PN) are the 3174 Peer Port Numbers (physical coax ports). HG 26-00 through 26-31 maps to X'00-31' and HG 27-00 through 27-31 maps to X'32-63' and is also hard coded. In this way, a workstation address is fixed to a coax port and the workstation MAC address needs to be changed if the workstation is moved to another port.

To gain more flexibility, you can define the MAC address in the Peer Device, which overrides the address defined by the 3174. This makes the Peer Device independent of the coax port connection.

Defining the 3174-Peer Bridge Profile

3174-Peer Bridge Profile		
670 - 7	Bridge Number	0-F
671 - CC1	Token-Ring Segment Number	001-FFF
672 - CCF	3174-Peer Segment Number	001-FFF
673 - 7	Token-Ring Hop Count	1-7
674 - Y	Frame Forwarding Active	Y,N,W
675 - 0010	Bridge Performance Threshold Frames Discarded Per 10,000	0000-9999
676 - 02 00	Logging Interval	00-99 Hours 00-59 Minutes
677 - 010	Alert Threshold	000-255

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 411. Definition of Bridge and Segment Numbers

This panel is only presented if Peer Communication is selected without Source Route Remote Bridging.

Bridge numbers, Token-Ring Segment numbers and Hop Count need to be well-coordinated to assign unique values when joining a bridged network.

Bridge Management Selection

Bridge Management		
652 - Y	3174-Peer LAN Manager Support	Y,N
653 - Y	3174-Peer Online Test Updates	Y,N

LAN Manager Profile

690 - 31741LM0	Reporting Link 0 Password	0-9, A-Z
691 - 31741LM1	Reporting Link 1 Password	0-9, A-Z
692 - 31741LM2	Reporting Link 2 Password	0-9, A-Z
693 - 31741LM3	Reporting Link 3 Password	0-9, A-Z

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 412. Selecting LNM Support and/or 3174 Online Test Updates

Q652=Y, the bridge is managed by the LAN Network Manager.

Q653=Y, the 3174 coordinator or the NetView operator are able to update bridge parameters online. If Q098 (Online Test Password) is left blank, or if any LNM reporting links are active, you cannot use the Online Test Update feature.

Q690 is the password for LNM Reporting Link 0, which links the bridge in the *controlling mode*.

Q691-Q693 are the passwords for LNM Reporting Links 1-3 in the *observing mode*.

The passwords do not need to be unique, but they must be six to eight characters in length.

20.1.3 Peer Communication Definition for OS/2 (WS-D)

For the 3270 Adapter in the workstation, we have to install a special driver, the *3270 Adapter for 3174 Peer Communication* together with the *IBM IEEE 802.2 protocol*, to make the coax attachment look like a token-ring adapter. For the higher layer protocols, it looks like and is used as a normal token-ring interface. The only difference is the reduced speed of a coax connection. The installation of the driver is done with the LAN Adapter and Protocol Support program.

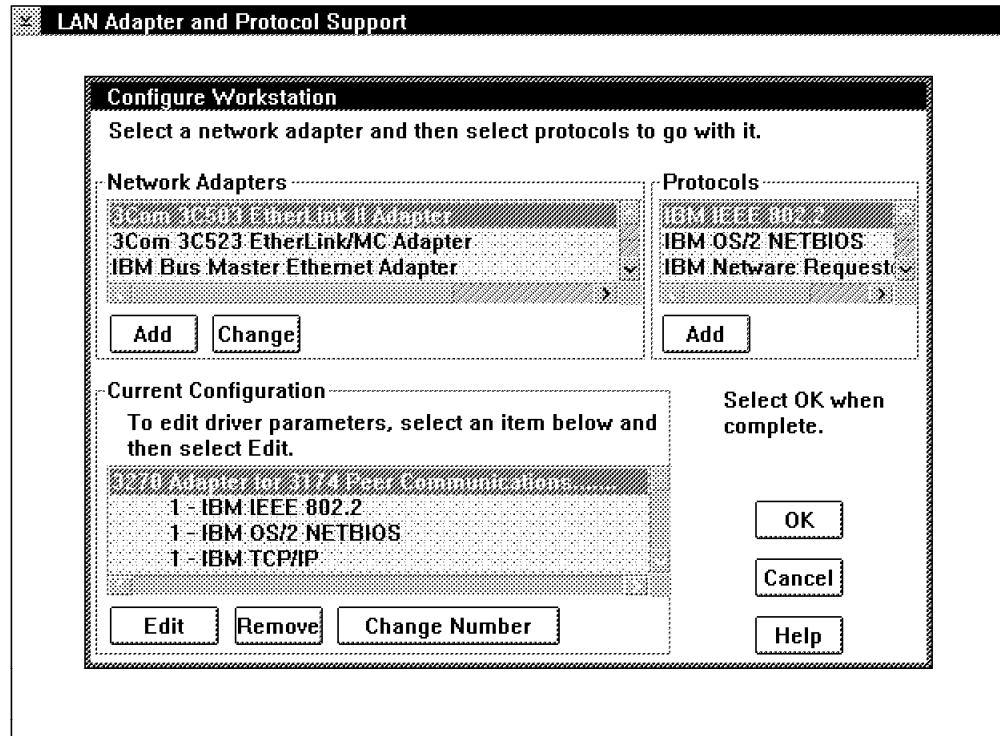


Figure 413. Configure Workstation Panel of LAPS

Please note that we use adapter number 1 for our configuration. This has to be considered during the communication manager setup procedure.

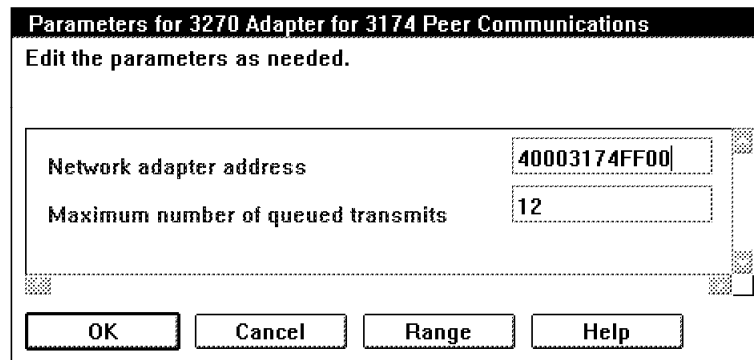


Figure 414. Network Adapter Address for Peer

The network adapter address has to be unique in the network, like any other token-ring address. By defining an address here, we override the default address defined in the 3174 Peer Communication setup shown in Figure 410 on page 351. The 3174 defined address is fixed to the coax port.

The advantage of defining the adapter address here is that you are independent of the coax port. If you change the coax port connection for a workstation, you do not need to make any changes in the 3174 or in the workstation configuration.

20.1.4 Network Definition File (NDF) for Workstations A, C, and D

NDF File for WS-D

```

DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.CM42992 ) 1
                  CP_ALIAS(CM42992 )
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN) 1
                  NODE_ID(X'05D42992')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(LINK0001)
                   ADJACENT_NODE_TYPE(NN) 3
                   PREFERRED_NN_SERVER(YES) 3
                   DLC_NAME(IBMTRNET)
                   ADAPTER_NUMBER(1) 6
                   DESTINATION_ADDRESS(X'40003174000204') 2
                   ETHERNET_FORMAT(NO)
                   CP_CP_SESSION_SUPPORT(YES) 4
                   SOLICIT_SSCP_SESSION(NO)
                   ACTIVATE_AT_STARTUP(YES)
                   USE_PUNAME_AS_CPNAME(NO)
                   LIMITED_RESOURCE(NO)
                   LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                   MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                   EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                   COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                   COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                   SECURITY(USE_ADAPTER_DEFINITION)
                   PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                   USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_DEFAULTS  IMPLICIT_INBOUND_PLU_SUPPORT(YES)
                  DEFAULT_MODE_NAME(BLANK)
                  MAX_MC_LL_SEND_SIZE(32767)
                  DIRECTORY_FOR_INBOUND_ATTACHES(*)
                  DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
                  DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
                  DEFAULT_TP_CONV_SECURITY_RQD(NO)
                  MAX_HELD_ALERTS(10);

DEFINE_TP  TP_NAME(APINGD) 5
           PIP_ALLOWED(NO)
           FILESPEC(E:\APPC\APINGD.EXE)
           CONVERSATION_TYPE(ANY_TYPE)
           CONV_SECURITY_RQD(NO)
           SYNC_LEVEL(EITHER)
           TP_OPERATION(NONQUEUED_AM_STARTED)
           PROGRAM_TYPE(BACKGROUND)
           RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

START_ATTACH_MANAGER;

```

Figure 415. APPC Definition for WS-D, Peer Communication

- 1** WS-D is defined as an end node with CPNAME=CM42992.
- 2** This is the token-ring MAC address for the link to the 314-11R.

- 3** The network node on this link is selected to be the preferred NN server for this workstation.
- 4** The initiation of a CP-CP session is requested to make this an APPN link.
- 5** APINGD is the APPC server program used in our APPN communication tests.
- 6** This adapter number matches the one we have defined in LAPS for the token-ring protocol (IEE 802.2) bound to the 3174 Peer Communication driver. adapter number defined in LAPS previously.

20.1.4.1 Network Configuration File for WS-A and WS-C

The NDF file for those two workstations look identical, except for the address of their network node server and the CPNAME. NNS for WS-C is the 3174-11R and for WS-A it is the 3174-43R.

NDF File for WS-A

- 1** WS-A has a CPNAME= CM32241.
- 2** The token-ring MAC address for the network node server 3174-43R, in this case, is X'400031740005'.

NDF File for WS-C

- 1** WS-C has a CPNAME= CM41992
- 2** The token-ring MAC address for the network node server 3174-11R, in this case, is X'400031740002'.

20.1.4.2 Network Definition File (NDF) Using Peer Communication for WS-D

As previously mentioned, to use 3270 host access from this workstation we need to install DLUR support. The NDF file shows an APPN link to the 3174 as the network node server (NNS) for this end node (EN). We are using APPC communication only. The client/server program used is the APING/APINGD program shipped with the communication manager program.

20.1.5 VTAM and NCP Definitions

In this part of the scenario we do not use any 3270 sessions and have no APPN links to VTAM.

Connection Verification for SNA and APPC:

Connection Verification for APPC sessions and VTAM displays are not included.

20.1.6 Configuration Diagram for the Bridged Network

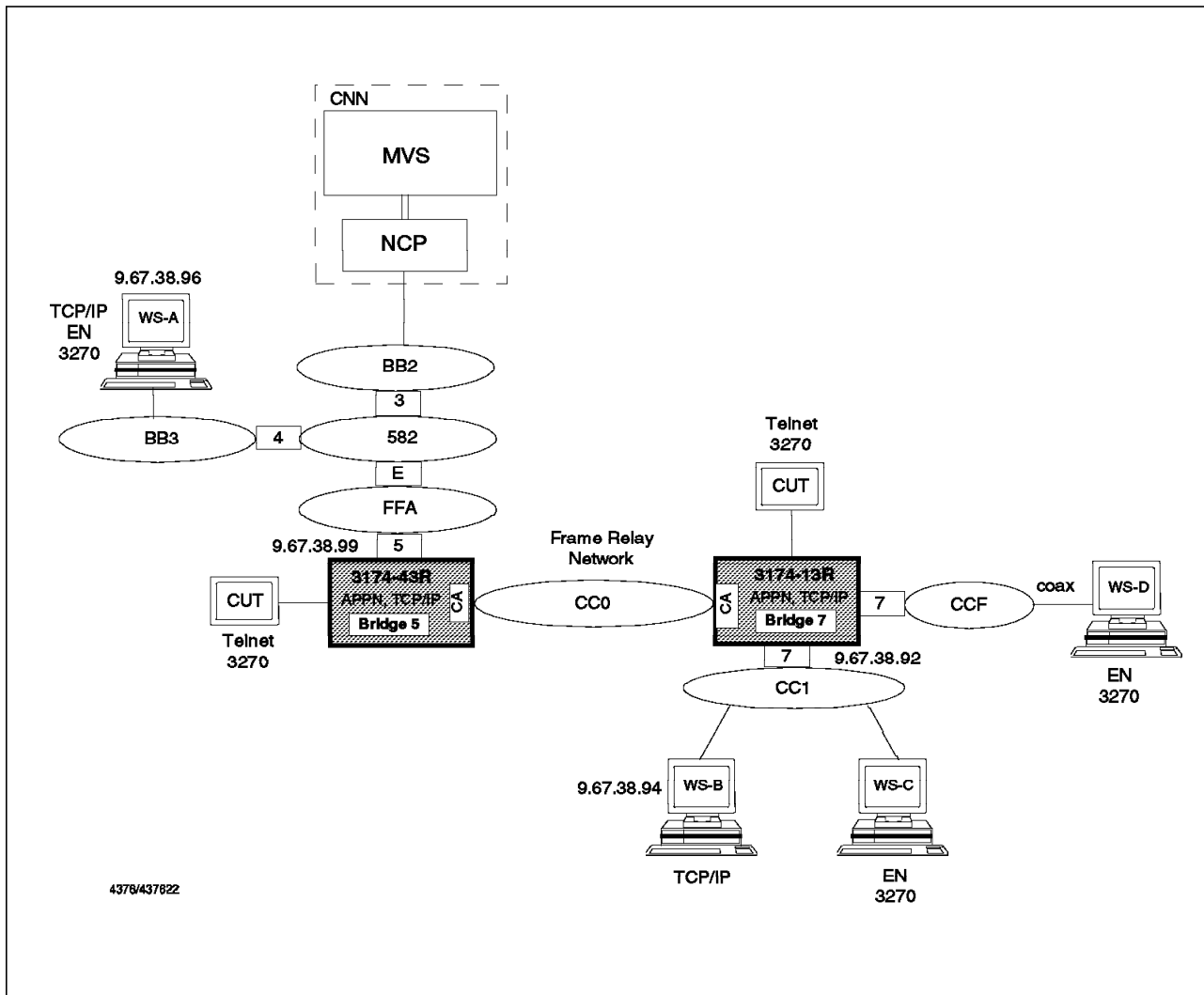


Figure 416. Bridging SNA, APPN and TCP/IP Traffic between 3174s

20.1.6.1 Configuration Description

In this part we define source route remote bridging in both 3174s and investigate what effect this has on the previously shown routed network design. Figure 416 depicts all token-ring segment and bridge numbers and how they are interconnected. The frame relay network is drawn as one LAN segment (CC0) connecting both 3174s. As bridging takes place on layer 2, for the upper layers, the network appears as one single token-ring. This logical view of the network is shown in 20.1.7, "Logical View of Bridged Network" on page 357. All participants of our network are seen as being adjacent to each other, but in reality, there is still the frame relay WAN network between the 3174s, but it has become transparent to the users of the network. Even the 3174s see each other as being located on the same ring.

This simplification of the network topology has a direct impact on the definitions of all participants, except for WS-A, which is already part of the local LAN. The following changes to the network are desirable or necessary:

- Change the model of the 3174 from 11R to 13R, where the primary host link is now the token-ring and uses the NCP as the gateway to the host.
- DLUR is not required anymore for the 3174, because the 3174 is now adjacent to VTAM/NCP and can receive the SSCP-PU/LU sessions directly over the token-ring host link, just like the 3174-43R.
- WS-B, WS-C and WS-D are no longer DSPUs of the 3174, and need no more DLUR connections to the host for their 3270 sessions. They can add an additional link to the host for access to the 3270 applications and keep the 3174 as NNS, or define a combined T2.1/PU2.0 link to VTAM and use the host as NNS. It is recommended that you use the 3174s as NNS and not to use precious host cycles for NNS duties.

Note: If you are using Connection Network definitions, you must use unique Virtual Routing Node (VRN) definitions for the local and the remote token-ring LAN.

20.1.7 Logical View of Bridged Network

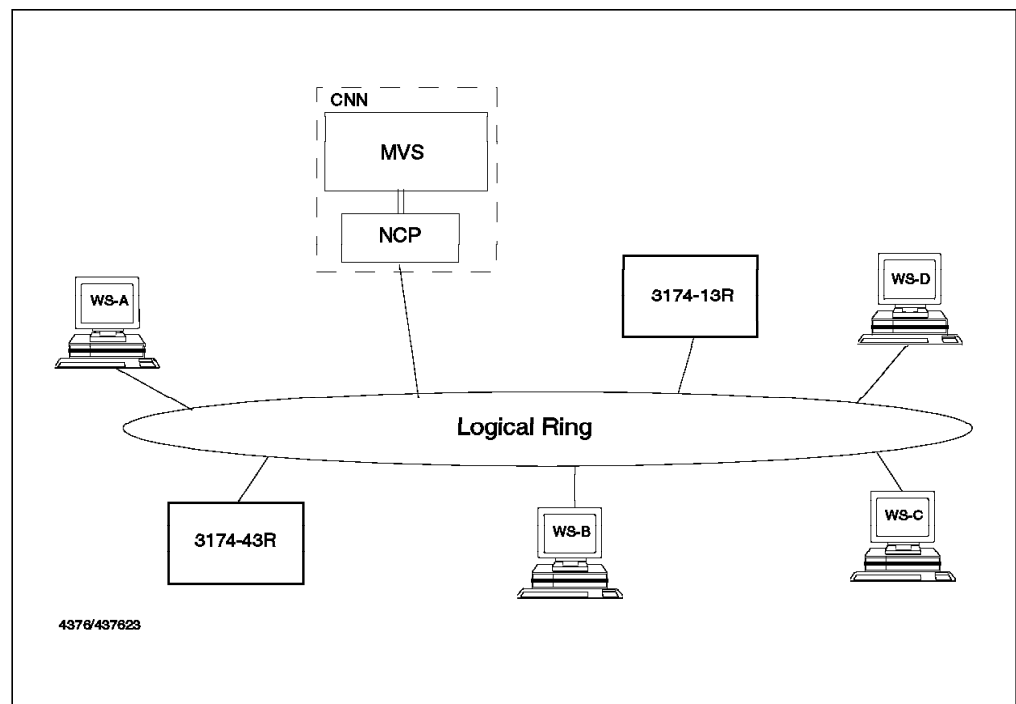


Figure 417. Logical View of Network

20.1.8 Changes to the 3174-11R Configuration

- **1** Change the 3174-11R to a model 3174-13R (TR-attached).
- **2** Change the primary host attachment from frame relay to token-ring, because in the bridged network it is now part of the local ring and adjacent to VTAM/NCP.
- **3** Replace frame relay with Local Area Network definitions.
- **4** Add a virtual MAC address (Q570) in the Frame Relay Description panel. This address is used by the LAN Network Manager, which requires a MAC address for the frame relay side of the bridge.

Defining new 3174 Model and Host Attachment

```

_____ Model / Attach _____

Online Test Password   098 - 3174

Product Assistance Data
099 -

3174 Model             100 - 13R 1

Host Attachment        101 - 7 2 1-BSC           6-SDLC, X.21 Switched
                        2-SDLC           7-Token-Ring
                        3-X.25           8-Ethernet
                        4-Non-SNA Channel 9-Frame Relay
                        5-SNA Channel    M-Multi-host

LAN adapter type       102 - 1  0-none
                        1-Token Ring
                        2-Ethernet

NSO selection          103 - 0000000000000000

PF: 3=Quit    4=Default    8=Fwd
```

Figure 418. 3174 with Token-Ring as Host Attachment

Describing the 3174 Token-Ring

```

_____ Token-Ring Description _____

Token-Ring Address     080 - 4000 3174 0002

Token-Ring Speed       082 - 0  0- 4Mbps
                        1-16Mbps
                        2-16Mbps with early Token Release

PF: 3=Quit    4=Default    7=Back    8=Fwd
```

Figure 419. Definition for the 3174 Token-Ring

Customizing the Local Area Network

```

_____ Local Area Network _____ 3

106 - 4000 3174 0002 04   107 - 4000 0109 0001 04   108 - 00000000
110 - 1 0000              116 - 1_ __
121 - 01 123 - 0          125 - 00000000          126 - 00000000   127 - 0 0
132 - 0 0 0 0            136 - 1 0 0 1          137 - 0 0 0 0   138 - 0
141 - A                  165 - 0                166 - A          168 - 0
172 - 0   173 - 00000000  175 -                179 - 0 0 0
213 - 1                  215 - 31742          220 - 0
382 - 0521               383 - 2
385 - IBMLAN             386 - 1

PF: 3=Quit   4=Default   7=Back   8=Fwd

```

Figure 420. 3174 LAN Definitions

Common SNA

```

_____ Common SNA _____

500 - 0          501 - USIBMRA   502 - _____
APPN Support Fields:
510 - 1          511 - CP31742   512 - VN31742

PF: 3=Quit   4=Default   7=Back   8=Fwd

```

Figure 421. Common SNA Panel

Frame Relay Link Definition

```

_____ Frame Relay Description _____

300 - 1          Enable Frame Relay 0-No, 1-Yes
313 - 0          NRZ 0-NRZ, 1-NRZI
552 - 020        Maximum Number of DLCIs 001-254
554 - 256000     Committed Information Rate 002048-256000
558 - 0          Congestion Control 0-No support, 1-Support
560 - 0          DE Bit Support 0-No support, 1-Support
562 - 3          LMI Type 1-None, 2-LMI Rev-1, 3-Annex-D, 5-CCITT
563 - 05         LMI Transmit Polling Interval 1-29
566 - 0000       Additional Receive Buffer Space 0000-1024
569 - N          Define DLCIs N-No, Y-Yes

4000 3174 2CC0   Virtual MAC Address 4

PF: 3=Quit   4=Default   7=Back   8=Fwd

```

Figure 422. Definition of Physical Link to the Frame Relay network

20.1.9 Changes to the APPN Configuration

- **1** Remove the DLUR definition. The 3174 is now adjacent to VTAM/NCP, and can receive SSCP-PU/LU sessions directly.
- **2** Change the link for the CP-CP connection to the 3174-43R from a frame relay link to a token-ring link. The APPN traffic between the two network nodes is now bridged and is no longer routed.
- **3** Add the CP-CP link to the adjacent network node RAI.

APPN Local Resource Definition

```

_____ APPN Node Definition _____

610 SESSIONS - 1          611 NODES/LINKS - 1
612 WILDCARD - 0          613 HOST LINK - 1A

Alert Focal Point 614-615
614 FP NAME - _____ 615 FP NETID - _____

Report to Alert Focal Point 616
616 HOST LINKS - _ _ _ _ _

DLUS Primary Host Name 620-621
620 CPNAME - 1          621 NETID - 1

DLUS Backup Host Name 622-623
622 CPNAME - _____ 623 NETID - _____

PF: 3=Quit    4=Default    8=Fwd

```

Figure 423. APPN Node Definition without DLUR

Adjacent Network Resources

```

_____ Network Resources _____
001 of 240
DLCI

CPNAME  NODE TYPE  LUs*  DLC TYPE  ADDRESS
1-4      1-5

1 CP31745_  3      -      1      4000 3174 0005 04 2
2 RAI_____ 3 3      -      1      4000 0109 0001 04
3 _____ -      -      -      _____
4 _____ -      -      -      _____
5 _____ -      -      -      _____
6 _____ -      -      -      _____
7 _____ -      -      -      _____
8 _____ -      -      -      _____
9 _____ -      -      -      _____
10 _____ -      -      -      _____
11 _____ -      -      -      _____
12 _____ -      -      -      _____

* - Enter 'X' to define Associated LUs where required.

PF: 3=Quit    4=Default    7=Back    8=Fwd    11=PageFwd

```

Figure 424. APPN Resource Definition

20.1.10 New: 3174-13R Peer and Bridges Configuration

This bridge parameters were set originally, when we defined bridging for the first time. With Q652 or Q653 set, the customization parameters are only relevant for the first IML. Any IML afterwards does not read the customization data; it uses an update file which is created for online update functions of LNM or 3174 RAS functions.

The customization data shown below differs from the actual bridge parameters set for the scenario. The actual ones are shown in the verification section.

No bridge filters are configured.

3174-Peer and Bridges from Panel

3174 Peer and Bridges Options		
650 - Y	Define 3174-Peer Support	Y,N
656 - 1	Multiport Bridging	0 = None 1 = Source Route Bridging
PF: 3=Quit 4=Default 8=Fwd		

Figure 425. 3174 Peer and Bridges Options Panel

The Source Route Bridging is enabled across all three interfaces: Token-ring, frame relay and Terminal Adapter. 3174-Peer Support is also enabled.

3174-Peer Definition

3174-Peer Definition		
3174-Peer Options		
651 - N	3174-Peer Bridge Support	Y,N
3174-Peer Station Parameters		
660 - 4000 3174 2F PN	3174-Peer Port Address Range	0000 00 - FFFF FF
661 - 05	Percentage of Discard Threshold	00 - 99
PF: 3=Quit 4=Default 7=Back 8=Fwd		

Figure 426. 3174 Peer Definition Panel

You must set Question 651=N. 3174-Bridge Support cannot be YES because Multiport Bridging Question 656 has been answered with YES.

For Question 660, please refer to the discussion in Figure 410 on page 351.

Source Route Bridge Definition

Source Route Bridge Definition

Bridge Parameters

680 - 7

Bridge Number 0-F

681 - 3

Bridge Maximum Frame Forward size
1=516 bytes, 2=1500 bytes, 3=2052 bytes

682 - 5000

Bridge Performance Threshold 0000 to 9999

683 - 00 15

Logging Interval
00 Hours 00 Minutes to 99 Hours 59 Minutes

684 - 010

Alert Threshold 000 to 255

685 - N

Token Ring Adapter in Wrap Mode Y,N

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 427. Source Route Bridge Definition Panel

For Question 680, the Bridge number must be unique between two segments connected to each other by multiple bridges.

For Question 685, YES enables Peer Devices to communicate to the host without requiring a token-ring attachment. Use NO, if you want to allow Peer Devices to communicate to the host over the token-ring.

Note: All parameters on this panel can be updated online with TEST 19, except Q681.

Source Route Bridge Interfaces

Source Route Bridge Interfaces

Interfaces	Segment Number	Frame Forwarding Active Y,N
Peer	CCF	Y
Token Ring	CC1	Y
TP Frame Relay	CC0	Y

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 428. Source Route Bridge Interfaces Panel

A minimum of two interfaces must be enabled for source route bridging to occur. Each segment number must be a unique segment in the entire bridged network. If you do not define a segment number here, it cannot be added by LNM or Online Update functions. If a segment is defined here, the Segment Number and Frame Forwarding for that Interface can be changed dynamically later on.

Manual Spanning Tree Mode

```

_____ Manual Spanning Tree Mode _____

Interfaces                                Forward
                                         STE Frames
                                         Y,N
-----                                -----
Peer                                    Y
Token Ring                             Y
TP Frame Relay                         Y

PF: 3=Quit    4=Default    7=Back    8=Fwd

```

Figure 429. Manual Spanning Tree Mode Panel

If you select NO for spanning tree mode, this interface does not forward single-route broadcast frames. Bridges which are in the blocking state will only block the single-route broadcast frames, while they will forward all-route broadcast frames, as well as non-broadcast frames which carry the appropriate routing information.

Bridge Management

```

_____ Bridge Management _____

652 - Y LAN Manager Support            Y,N
653 - Y 3174 Online Test Updates      Y,N

LAN Manager Profile

690 - 31742LM0 Reporting Link 0 Password 0-9, A-Z
691 - 31742LM1 Reporting Link 1 Password 0-9, A-Z
692 - 31742LM2 Reporting Link 2 Password 0-9, A-Z
693 - 31742LM3 Reporting Link 3 Password 0-9, A-Z

PF: 3=Quit    4=Default    7=Back    8=Fwd

```

Figure 430. Selecting LNM Support and/or 3174 Online Test Updates

For Question 653=Y, the 3174 coordinator or the NetView operator is able to update bridge parameters online.

Question 690 is the password for LNM Reporting Link 0, which links the bridge in the controlling mode.

Question 691-Question 693 are the passwords for LNM Reporting Links 1-3 in the observing mode.

Note: 3174 Online Test Updates are not allowed while any LNM link is active. When an online update is made via LNM, the controlling LAN Manager updates all observing LAN Managers with the current bridge status. If online updates are made via RAS when observing links are active, there is no way to report the current state of the bridge to the observing links. Thus, observing LAN Managers would be out of sync with the current state of the network.

20.1.11 Changes to the 3174-43R Configuration

No changes in the 3174 configuration are necessary. The token-ring remains the primary host attachment, and the LAN configuration stays unchanged.

We need to change the following:

- **1** The virtual routing node (VRN) name for the connection network should now match the name used in the local network, but must be different than the one used in the 3174-13R.

You can use the VTAM command *D NET,TOPO,LIST=VN* to find what VRN is used. In our case it is RACONNET.

- **2** Add the virtual MAC address for the frame relay port which will be used by LAN Network Manager.

Common SNA

_____ Common SNA _____

500 - 0 501 - USIBMRA 502 - _____

APPN Support Fields:

510 - 1 511 - CP31745 512 - RACONNET **1**

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 431. Common SNA Panel

Frame Relay Link Definition

_____ Frame Relay Description _____

300 - 1 Enable Frame Relay 0-No, 1-Yes

313 - 0 NRZ 0-NRZ, 1-NRZI

552 - 020 Maximum Number of DLCIs 001-254

554 - 256000 Committed Information Rate 002048-256000

558 - 0 Congestion Control 0-No support, 1-Support

560 - 0 DE Bit Support 0-No support, 1-Support

562 - 3 LMI Type 1-None, 2-LMI Rev-1, 3-Annex-D, 5-CCITT

563 - 05 LMI Transmit Polling Interval 1-29

566 - 0000 Additional Receive Buffer Space 0000-1024

569 - N Define DLCIs N-No, Y-Yes

570 - 4000 3174 5CC0 Virtual MAC Address **2**

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 432. Definition of Physical Link to the Frame Relay network

20.1.12 Changes to the APPN Configuration

1 The only change required is to replace the frame relay link address for the 3174 CP-CP session to the token-ring MAC address of the 3174-13R.

Adjacent Network Resources

Network Resources							
	CPNAME	NODE TYPE 1-4	LUs* X	DLC TYPE 1-5	ADDRESS		001 of 240 DLCI
1	CP31742_	3	-	1	4000 3174 0002 04	1	___
2	RAI_	3	-	1	4000 0109 0001 04		___
3		-	-	-			___
4		-	-	-			___

* - Enter 'X' to define Associated LUs where required.

PF: 3=Quit 4=Default 7=Back 8=Fwd 11=PageFwd

Figure 433. APPN Resource Definition

20.1.13 New: 3174-43R Peer and Bridges Configuration

The same considerations for defining the bridge parameters apply to this 3174, as explained in 20.1.10, "New: 3174-13R Peer and Bridges Configuration" on page 361.

3174 Peer Communication is not used on this machine.

Also, no bridge filters are configured.

3174 Peer and Bridges Options

3174 Peer and Bridges Options		
650 - N	Define 3174-Peer Support	Y,N
656 - 1	Multiport Bridging	0 = None 1 = Source Route Bridging

PF: 3=Quit 4=Default 8=Fwd

Figure 434. 3174 Peer and Bridges Options Panel

3174-Peer Definition

3174-Peer Definition		
3174-Peer Options		
651 - N	3174-Peer Bridge Support	Y,N
3174-Peer Station Parameters		
660 - 4000 3174 5F PN	3174-Peer Port Address Range	0000 00 - FFFF FF
661 - 05	Percentage of Discard Threshold	00 - 99
PF: 3=Quit 4=Default 7=Back 8=Fwd		

Figure 435. 3174 Peer Definition Panel

Source Route Bridge Definition

Source Route Bridge Definition		
Bridge Parameters		
680 - 5	Bridge Number	0-F
681 - 3	Bridge Maximum Frame Forward size	1=516 bytes, 2=1500 bytes, 3=2052 bytes
682 - 5000	Bridge Performance Threshold	0000 to 9999
683 - 00 15	Logging Interval	00 Hours 00 Minutes to 99 Hours 59 Minutes
684 - 010	Alert Threshold	000 to 255
685 - N	Token Ring Adapter in Wrap Mode	Y,N
PF: 3=Quit 4=Default 7=Back 8=Fwd		

Figure 436. Source Route Bridge Definition Panel

Source Route Bridge Interfaces

Source Route Bridge Interfaces		
Interfaces	Segment Number	Frame Forwarding Active Y,N
Peer		N
Token Ring	FFA	Y
TP Frame Relay	CCO	Y
PF: 3=Quit 4=Default 7=Back 8=Fwd		

Figure 437. Source Route Bridge Interfaces Panel

Manual Spanning Tree Mode

Manual Spanning Tree Mode	
Interfaces	Forward STE Frames Y,N
Peer	N
Token Ring	Y
TP Frame Relay	Y

PF: 3=Quit 4=Default 7=Back 8=Fwd

Figure 438. Manual Spanning Tree Mode Panel

Bridge Management

Bridge Management	
652 - Y LAN Manager Support	Y,N
653 - Y 3174 Online Test Updates	Y,N
LAN Manager Profile	
690 - 31745LM0 Reporting Link 0 Password	0-9, A-Z
691 - 31745LM1 Reporting Link 1 Password	0-9, A-Z
692 - 31745LM2 Reporting Link 2 Password	0-9, A-Z
693 - 31745LM3 Reporting Link 3 Password	0-9, A-Z

PF: 3=Quit 4=Default 7=Back 8=Fwd

0

Figure 439. Bridge Management Panel

20.1.14 Changes to Workstation Definitions

- APPN** WS-A - No change, the 3174-43R remained its network node server.
WS-C - No change, the 3174-13R remained its network node server.
WS-D - For the 3174 Peer-attached workstation, we decided to use VTAM as the network node server and use a combined SNA/APPN host link to support APPC and 3270 sessions.
- SNA** For WS-A and WS-C we added an additional host link to support 3270 dependent LUs. There are more requirements for DLUR because the workstation is now adjacent to VTAM. PU/LU definitions in a switched major node are required and the LAN gateway address for the host link definition is required.
- Bridging** No definitions are necessary. CM/2 supports source route bridging as an end station, and uses the discovery process to find the route to the remote partner.

20.1.15 Changes to VTAM/NCP Definitions

This is a consolidated switched major node for all components involved, to support APPN links and 3270 sessions of the 3174s and the workstations. DLUR definitions are been omitted.

Switched Major Node

```
*****
*          RAI - 3174 AND PS/2 IN BRIDGED NETWORK          *
*****
SW3174BR VBUILD MAXGRP=5,          REQUIRED          X00010480
              MAXNO=12,            REQUIRED          X00010490
              TYPE=SWNET           REQUIRED          00010500
*****
*  PU AND LU'S DEFINITION FOR 3174-13R
*****
*
P31742  PU  ADDR=C1,              COULD BE ANYTHING (NOT USED)  X00010540
              MAXDATA=521,        PS/2  SYSTEM                X00010550
              DISCNT=NO,          X00010570
              MAXOUT=7,           X00010580
              NETID=USIBMRA,      X00010570
              IDBLK=017,         X
              IDNUM=31742,       X
              CPNAME=CP31742,    X00010590
              MAXPATH=2,         X00010590
              PACING=(7,1),      X00010610
              VPACING=8,         X00010610
              PUTYPE=2,          X00010620
              PASSLIM=7,         X
              ISTATUS=ACTIVE
*
*-----DLU DEFINITION -----
*
S3174202 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X,          X00010650
              DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
S3174203 LU  LOCADDR=3,MODETAB=AMODETAB,USSTAB=US327X,          X00010650
              DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
*****
*  PU AND LU'S DEFINITION FOR 3174-43R
*****
**
P31745  PU  ADDR=C1,              COULD BE ANYTHING (NOT USED)  X00010540
              MAXDATA=521,        PS/2  SYSTEM                X00010550
              DISCNT=NO,          X00010570
              MAXOUT=7,           X00010580
              NETID=USIBMRA,      X00010570
              IDBLK=017,         X
              IDNUM=31745,       X
              CPNAME=CP31745,    X00010590
              MAXPATH=2,         X00010590
              PACING=(7,1),      X00010610
              VPACING=8,         X00010610
              PUTYPE=2,          X00010620
              PASSLIM=7,         X
              ISTATUS=ACTIVE
*
*-----DLU DEFINITION -----
*
S3174502 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X,          X00010650
              DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
S3174503 LU  LOCADDR=3,MODETAB=AMODETAB,USSTAB=US327X,          X00010650
              DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
```

Figure 440 (Part 1 of 3). VTAM Switched Major Node for Bridged Network

```

***** 00010640
*   PU AND LU'S DEFINITION FOR WS-A
*****
**                                00010640
P9WSA  PU  ADDR=C1,              COULD BE ANYTHING (NOT USED) X00010540
          MAXDATA=521,          PS/2  SYSTEM X00010550
          DISCNT=NO, X00010570
          MAXOUT=7, X00010580
          NETID=USIBMRA, X00010570
          IDBLK=05D, X
          IDNUM=32241, X
          CPNAME=CM32241, X00010590
          MAXPATH=2, X00010590
          PACING=(7,1), X00010610
          VPACING=8, X00010610
          PUTYPE=2, X00010620
          PASSLIM=7, X
          ISTATUS=ACTIVE
**                                00010640
*-----DLU DEFINITION -----
**
S9WSA02 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X00010650
          DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
***** 00010640
*   PU AND LU'S DEFINITION FOR WS-C
*****
**                                00010640
P9WSC  PU  ADDR=C1,              COULD BE ANYTHING (NOT USED) X00010540
          MAXDATA=521,          PS/2  SYSTEM X00010550
          DISCNT=NO, X00010570
          MAXOUT=7, X00010580
          NETID=USIBMRA, X00010570
          IDBLK=061, X
          IDNUM=41992, X
          CPNAME=CM41992, X
          MAXPATH=2, X00010590
          PACING=(7,1), X00010610
          VPACING=8, X00010610
          PUTYPE=2, X00010620
          PASSLIM=7, X
          ISTATUS=ACTIVE
**                                00010640
*-----DLU DEFINITION -----
**
S9WSC02 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X00010650
          DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN

```

Figure 440 (Part 2 of 3). VTAM Switched Major Node for Bridged Network

```

***** 00010640
*   PU AND LU'S DEFINITION FOR WS-D
*****
**                                     00010640
P9WSD  PU  ADDR=C1,                COULD BE ANYTHING (NOT USED) X00010540
          MAXDATA=521,            PS/2  SYSTEM X00010550
          DISCNT=NO,              X00010570
          MAXOUT=7,              X00010580
          NETID=USIBMRA,         X00010570
          IDBLK=05D,             X
          IDNUM=42992,           X
          CPNAME=CM42992,        X00010590
          MAXPATH=2,            X00010590
          PACING=(7,1),         X00010610
          VPACING=8,            X00010610
          PUTYPE=2,             X00010620
          PASSLIM=7,            X
          ISTATUS=ACTIVE
**
**                                     00010640
*-----DLU DEFINITION -----
**
S9WSD02 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X00010650
          DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN
***** 00010640
*   PU AND LU'S DEFINITION FOR WS-B
*****
**                                     00010640
P9WSB  PU  ADDR=C1,                COULD BE ANYTHING (NOT USED) X00010540
          MAXDATA=521,            PS/2  SYSTEM X00010550
          DISCNT=NO,              X00010570
          MAXOUT=7,              X00010580
          NETID=USIBMRA,         X00010570
          IDBLK=061,             X
          IDNUM=49992,           X
          CPNAME=CM49992,        X00010590
          MAXPATH=2,            X00010590
          PACING=(7,1),         X00010610
          VPACING=8,            X00010610
          PUTYPE=2,             X00010620
          PASSLIM=7,            X
          ISTATUS=ACTIVE
**
**                                     00010640
*-----DLU DEFINITION -----
**
S9WSB02 LU  LOCADDR=2,MODETAB=AMODETAB,USSTAB=US327X, X00010650
          DLOGMOD=M2SDLCQ,ISTATUS=ACTIVE,LOGAPPL=RAIAN

```

Figure 440 (Part 3 of 3). VTAM Switched Major Node for Bridged Network

20.1.16 Verifying the Bridge Operation

The verification includes displays of the 3174 bridge status and also displays to prove that the participants truly communicate as predicted using APPC, TCP/IP and 3270 protocols. For the verification of the source routes, we utilize a program called OS2PING, which sends an explorer frame to a partner and displays the RIF frame on the screen.

20.1.16.1 Frame Relay Interface Display - 3174-13R

____List all DLCI status and data types____		
DLCI Number	PVC Status	Data Type s
Decimal / Hex / Q.922	New/Active	Received and Processed
-----	-----	-----
0501 / 1F5 / 7C51	ACTIVE	**Not determined yet
0502 / 1F6 / 7C61	ACTIVE	**Not determined yet
0503 / 1F7 / 7C71	NEW	**Not determined yet
0504 / 1F8 / 7C81	ACTIVE	**Not determined yet
0505 / 1F9 / 7C91	ACTIVE	RB 1
Note: FECN, BECN and DE are set to zero for Q.922 DLCI display format		
To go directly to other tests, enter: /Test,Option		
Select Test; press ENTER ==> /18,3		
PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu		

Figure 441. Frame Relay Link, DLCI Status

1 DLCI 505 is the PVC between the two 3174 bridges. The Data Type shows the type of frames that have been received and recognized. A Data Type of RB indicates that the 3174 has received source route bridge frames over this DLCI and is configured for bridging.

3174 Test Menu /19, for Peer and Bridge Information

Please remember, that Test /19 is also used to do updates to the bridge parameters, if you enter a u for update mode at the end of each selected option. If you invoke the test in update mode, you will be prompted for the password that was set up in configuration question 098. PF4 in the update panels validates the responses and saves them on a disk. This must be done before leaving the panel.

3174 Peer Device Status

Display 3174-Peer Status - HG 26					
Port	Current Address	Functional Address	Group Address	Discarded Frame Ctr	Device Status
00					
01					
.					
.					
04					
05	4000 3174 FF00			1 0	1 2
06					
.					
.					
15					

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==> /19,1

PF: 3=Quit 5=Refresh 8=Fwd 9=Ctr->0 12=Test Menu

Figure 442. Display 3174 Peer Status - HG 26

1 This is the MAC address defined in the LAPS definition of WS-D, as shown in Figure 414 on page 353.

2 The device status of 1 indicates Enabled. The 3174 Peer device is powered on and communicates as a 3174 Peer device.

20.1.16.2 3174-11R Source Route Bridge Profile

Display 3174 Source Route Bridge Profile		
Bridge Status : 1 Frame Forwarding Active		

* 7	2 Bridge Number	0-F
2052	Largest frame size	
* 5000	Bridge Performance Threshold	0000-9999
	Frames Discarded Per 10,000	
* 00 : 15	Logging Interval	00-99 Hours: 00-59 Minute
010	Alert Threshold	000-255
3	3 Number of ports configured	
* Override to Customized Data 4		
To go directly to other tests, enter: /Test,Option		
Select Test; press ENTER ==> /19,2		
PF: 3=Quit 5=Refresh 12=Test Menu		

Figure 443. Display 3174 Source Route Bridge Profile

1 The bridge Status indicates that the Source Route Bridge function is configured and at least two ports are in the frame forwarding state.

2 The bridge number 7 is relevant for all three segments: the Peer, the token-ring and the frame relay segment.

3 All three possible ports have been configured for this bridge: Peer, token-ring and frame relay port.

4 The asterisk indicates that the originally customized bridge parameters have been updated online using the LNM or the 3174 RAS function. When customizing questions 653 - 3174 Online Test Updates, or when 652 - LAN Manager Support is selected, the 3174 writes the bridge parameters on a separate file, which overrides the customization data at IML time.

20.1.16.3 Display of 3174 Bridge Port Information (Frame Relay Port)

Bridge Port Status

```
_____Display 3174 Bridge Port Information_____
                                     Interface: 1 TP Frame Relay
Bridge Port Status :      Frame Forwarding Active 2
-----
CCO 3 Segment Number          001-FFF
7   4 Receive Hop Count      1-7
7   4 Transmit Hop Count     1-7
* Y 5 Frame Forwarding Active Y=yes, N=no
* Y 6 STE Forwarding Active   Y=yes, N=no
N   7 Token Ring Adapter in Wrap Mode Y=yes, N=no

* Override to Customized Data

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,3

PF: 3=Quit 5=Refresh 8=Fwd 12=Test Menu
```

Figure 444. Display 3174 Bridge Port Information for Frame Relay (1 of 5)

1 Indicates for which port this information is relevant.

2 The frame relay Bridge Port is active.

Bridge Port Status values:

- Frame Forwarding Active
- Frame Forwarding Inactive
- Token-ring failure

3 The Segment Number for the frame relay port is still the same as originally customized, but can be updated dynamically, without an IML of the 3174.

4 Receive and Transmit Hop Count has not been changed and has been left to the default value.

5 Frame Forwarding is active for All Route Explorer (ARE) frames and Specifically Routed Frames (SRF).

6 Spanning Tree Explorer (STE) frames are forwarded, meaning that the port is selected to take part in the spanning tree of the network.

7 This allows host communication to a peer device over a token-ring attachment.

Mapping DLCI and Segment Number

Display 3174 Bridge Port Information Mapping DLCI and Segment Number				
Interface	Bridge Port	DLCI Number	Port Status	Segment Number
Peer	1	N/A	Enabled	CCF
Token-Ring	2	N/A	Enabled	CC1
1 * TP Frame Relay	3	N/A	Enabled	CC0
		2 1F9	Enabled	CC0

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,3

PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu

Figure 445. 3174 Bridge Port Information for Frame Relay (2 of 5)

When in update mode, the segment number can be changed dynamically on this panel. **1** indicates that the segment number for the frame relay port has been altered at least once.

2 The 3174 has discovered bridge traffic on DLCI X'1F9 (decimal 505), which we have seen in the Data Type field of the frame relay status display in Figure 441 on page 371. In total, eight DLCIs can support bridge traffic. The first eight DLCIs which receive and recognize a bridged frame are supported for remote bridging and are displayed here.

- Use /18,3 to see all active DLCIs.
- Remote Bridging DLCIs will display RB as a Data Type.

Counters for Frame Forwarded

Display 3174 Bridge Port Information Counters for frame forwarded	
Interface: 1 TP Frame Relay	
Frames forwarded from the port	
STE frames received	30,395
STE frames xmitted	24
ARE frames received	46,025
ARE frames xmitted	951
SRF frames received	938
SRF frames xmitted	865
Bytes forwarded from the port	
STE bytes xmitted	2,607
ARE bytes xmitted	62,718
SRF bytes xmitted	116,669

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,3

PF: 3=Quit 5=Refresh 7=Back 8=Fwd 9=Ctr->0 12=Test Menu

Figure 446. 3174 Bridge Port Information for Frame Relay (3 of 5)

1 These counters are relevant for the frame relay port and are accumulated figures for frames and bytes forwarded by the bridge since the last reset. To see the counters, select /19,3,2 for the token-ring port and /19,3,1 for the Peer port.

Frames not forwarded

Display 3174 Bridge Port Information		
Frames not forwarded		
Interface:	TP	Frame Relay
Frames not forwarded from the port because:		
	Transmit	Receive
Target Segment inoperable	0	
Frame size too large	0	
Filtered frame	0	0
Segment congestion	0	0
Other Causes	0	0
Duplicate segment number SRF		0
Duplicate segment number STE		0
Hop Count exceeded STE & ARE		3,714
Segment mismatch STE & ARE		0
Invalid RI field STE & ARE		0
To go directly to other tests, enter: /Test,Option		
Select Option; press ENTER ==> /19,3,3		
PF: 3=Quit 5=Refresh 7=Back 8=Fwd 9=Ctr->0 12=Test Menu		

Figure 447. 3174 Bridge Port Information for Frame Relay (4 of 5)

These are the number of frames the bridge was not able to forward on the frame relay port. The reasons are listed on the left side of the counters.

The same figures exist for the token-ring port /19,3,2 and the Peer port /19,3,1.

Counters are not incremented when:

- Frame forwarding is inactive
- Spanning Tree is inactive (for STE frames)
- Fragmented frames are discarded

For two counters we would like to add the following information:

Counters for receive side

- **STE Duplicate Segment Number**

This is the number of STE frames discarded because the target segment ID already exists in the RI field. This error may indicate that there is a logical loop in the Spanning Tree causing multiple copies of the same STE frame to be forwarded onto the same ring. Alternately, this error may indicate that the port segment number is not unique in the network.

- **Other Causes**

This is the number of frames discarded by the receiving bridge port due to miscellaneous error conditions, like:

- The frame is a MAC frame or a BPDU (Bridge Protocol Data Unit) frame, which is a special configuration message for automatic spanning tree operation.
- The frame does not have routing information.
- A specifically routed frame has a frame size of less than 20 bytes.

- A specifically routed frame has an RI length of less than 6 bytes or greater than 18 bytes.
- The receiving bridge port or the target bridge port is not in a state to forward the frame.
- A bridge frame received over a ninth DLCI (only eight DLCIs are supported).
- It cannot determine a target bridge port for a specifically routed frame on the TP bridge port.
- The frame is too large to receive on token-ring port.

Discard Threshold Exceeded Counters

Display 3174 Bridge Port Status												
Discard Threshold Exceeded Counters												
Interface: TP Frame Relay												
Hour	00	05	10	15	20	25	30	35	40	45	50	55
00:00	.	.	.	.	.	.	.	.	.	.	.	.
01:00	.	.	.	.	.	.	.	.	.	.	.	.
02:00	.	.	.	.	.	.	.	.	.	.	.	.
03:00	.	.	.	.	.	.	.	.	.	.	.	.
04:00	.	.	.	.	.	.	.	.	.	.	.	.
05:00	.	.	.	.	.	.	.	.	.	.	.	.
06:00	.	.	.	.	.	.	.	.	.	.	.	.
07:00	.	.	.	.	.	.	.	.	.	.	.	.
08:00	.	.	.	.	.	.	.	.	.	.	.	.
09:00	.	.	.	.	.	.	.	.	.	.	.	.
10:00	.	.	.	.	.	.	.	.	.	.	.	.
11:00	.	.	.	.	.	.	.	.	.	.	.	.

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==> /19,3,3

PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu

Figure 448. 3174 Bridge Port Information for Frame Relay (5 of 5)

This displays the number of one minute intervals within each five minute period that the bridge port is congested. This happens when the bridge percentage threshold of discarded frames has exceeded the counters, which was specified in Question 682.

20.1.16.4 Display of 3174 Bridge Port Information (Token-Ring Port)

This is the only panel presented here for the token-ring port.

1 This is the Bridge Port information for the token-ring port, showing specific information like: Segment Number (CC1), and Bridge Port Status, which are relevant for our configuration. The DLCI mapping panel for the Peer port shows the same information as in Figure 445 on page 374 and the counter panels are used for performance and problem determination only. This is why they are not repeated here.

```

_____Display 3174 Bridge Port Information_____

                                Interface: 1 Token-Ring

Bridge Port Status :      Frame Forwarding Active
-----
      CC1  Segment Number          001-FFF
      7    Receive Hop Count       1-7
      7    Transmit Hop Count      1-7
* Y      Frame Forwarding Active   Y=yes, N=no
* Y      STE Forwarding Active     Y=yes, N=no
      N    Token Ring Adapter in Wrap Mode Y=yes, N=no

      * Override to Customized Data

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,2

PF: 3=Quit 5=Refresh 8=Fwd 12=Test Menu

```

Figure 449. Display 3174 Bridge Port Information for Token-Ring

20.1.16.5 Display of 3174 Bridge Port Information (Peer Port)

This is the only panel presented here for the peer port.

1 This is the Bridge Port information for the Peer port, showing specific information like: Segment Number (CCF), and Bridge Port Status, which are relevant for our configuration. The DLCI mapping panel for the Peer port shows the same information as in Figure 445 on page 374 and the counter panels are used for performance and problem determination only. This is why they are not repeated here.

```

_____Display 3174 Bridge Port Information_____

                                Interface: 1 Peer

Bridge Port Status :      Frame Forwarding Active
-----
      CCF  Segment Number          001-FFF
      1    Receive Hop Count       1-7
      7    Transmit Hop Count      1-7
* Y      Frame Forwarding Active   Y=yes, N=no
* Y      STE Forwarding Active     Y=yes, N=no
      N    Token Ring Adapter in Wrap Mode Y=yes, N=no

      * Override to Customized Data

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,1

PF: 3=Quit 5=Refresh 8=Fwd 12=Test Menu

```

Figure 450. Display 3174 Bridge Port Information for Peer

20.1.16.6 LAN Manager Profile

```
_____ Display LAN Manager Profile _____

Link/Type          0/0 1          1/2 2
Password 5
Congestion Frame Ctr 00000          00000
Link Address 400052005250F4 3      40005200631599
Number of Hops 04          02
TR Fn Classes 80000102          80000102
3174-Peer Fn Classes 00000000 00000000 4 00000000 00000000
TP Frame Relay Fn Classes 4

Link/Type          2/2          3/2
Password
Congestion Frame Ctr
Link Address
Number of Hops
TR Fn Classes
3174-Peer Fn Classes
TP Frame Relay Fn Classes

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==> /19,4

PF: 3=Quit 5=Refresh 9=Ctrl->0 12=Test Menu
```

Figure 451. Display LAN Manager Profile

In our case, two LAN Managers are linked to the 3174 Bridge and are defined in items 1 and 2.

1 The LNM on Reporting Link 0 has a Type 0, which means that this is the Controlling LAN Manager.

2 The LNM on Reporting Link 1 has a Type 2, which means that this is an Observing LAN Manager.

3 This is the MAC address of the LNM.

4 The function Class for token-ring, Peer and frame relay link indicates which Server Function is available to the LNM on that particular link. There are four different Function Classes:

- Bridge
- Configuration Report Server
- Ring Error Monitor
- Ring Parameter Server

Not all function classes are available to LNM on all three links.

5 The Password is visible and also changeable if you are in the update mode.

Note: If no LAN Manager data is displayed, then the 3174 is not currently connected to a LNM. If a LNM is connected in either the controlling or observing mode, the RAS Online Update function is not available, except for updating the LNM Password.

20.1.16.7 Bridge Filter Statistics Display (Token Ring)

Filters can be enabled or disabled online and saved with PF4. The responses are validated and saved in the memory.

The Hop Count filter cannot be enabled or disabled.

Note: Unlike bridge parameters which are saved on disk, the filter updates are saved in memory and changes *are lost* when the 3174 is re-IMLed. For permanent changes, updates must be done via customization.

A frame may be seen by multiple filters before being forwarded or discarded. Multiple filter counters may be incremented by one frame.

Display Bridge Filters						
Interface:	Token-Ring	1				
Direction:	RECEIVE	2				
Total number of frames seen by this interface:		3	3,839			
Filter Type	Enable/ Disable	Frames forwarded		Frames discarded		Order
		Number	%	Number	%	
Hop Count	N/A	3,839	100	0	0	1
Source SAP	4					
SNAP Ethertype						
Route Designator						
MAC Address						
Frame Data & Off.						
All Filters		3,839	100	0	0	
To go directly to other tests, enter: /Test,Option Select Option; press ENTER ==> /19,5,2,r						
PF: 3=Quit 5=Refresh 12=Test Menu						

Figure 452. Display Bridge Filters - Receive

We only show here the panel for direction: RECEIVE and interface: token-ring.

The Bridge Filter Statistics displays (Transmit/Receive) for the Peer and the frame relay interfaces are identical and are not repeated here, as we have not set any filters for this scenario.

- 1 Filters do apply for each interface type: Peer, token-ring and frame relay.
- 2 The direction to which the filter applies can be RECEIVE (and TRANSMIT) and is selectable for receive (and transmit).
- 3 This indicates the total number of frames seen by this interface and direction.
- 4 If a filter is configured, it will show an E for enabled or a D for disabled. Except for the hop count filter, this field can be updated online.

20.1.16.8 3174 Peer and Bridge Display - 3174-43R

The displays for the 3174-43 Bridge are so similar to the 3174-13R that we only show those which are different.

20.1.16.9 3174 Source Route Bridge Profile

```
__Display 3174 Source Route Bridge Profile__

Bridge Status :      Frame Forwarding Active
-----

* 5  1 Bridge Number              (0-F)
    2052 Largest frame size
* 5000 Bridge Performance Threshold (0000-9999)
      (Frames Discarded Per 10,000)
* 00 : 15 Logging Interval          (00-99 Hours: 00-59 Minute
  010 Alert Threshold              (000-255)

  2  2 Number of ports configured

* Override to Customized Data

To go directly to other tests, enter: /Test,Option
Select Test; press ENTER ==> /19,2

PF: 3=Quit 5=Refresh 12=Test Menu
```

Figure 453. Display 3174 Source Route Bridge Profile

- 1** The bridge number for this bridge is 5 and applies to all ports.
- 2** This bridge has only two ports configured (token-ring and frame relay).

20.1.16.10 Display of 3174 Bridge Port Information (Token-Ring Port)

Bridge Port Status

```
__Display 3174 Bridge Port Information__

Interface:      Token-Ring

Bridge Port Status :      Frame Forwarding Active
-----

1 FFA Segment Number              (001-FFF)
  7 Receive Hop Count              (1-7)
  7 Transmit Hop Count             (1-7)
* Y Frame Forwarding Active        (Y=yes, N=no)
* Y STE Forwarding Active          (Y=yes, N=no)
  N Token Ring Adapter in Wrap Mode (Y=yes, N=no)

* Override to Customized Data

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,2

PF: 3=Quit 5=Refresh 8=Fwd 12=Test Menu
```

Figure 454. Display 3174 Bridge Port Information for Token-Ring

- 1** FFA is the segment number for the token-ring port.

Mapping DLCI and Segment Number

Display 3174 Bridge Port Information Mapping DLCI and Segment Number				
Interface	Bridge Port	DLCI Number	Port Status	Segment Number
Peer	1	N/A		
Token-Ring	2	N/A	Enabled	FFA
* TP Frame Relay	3	N/A	Enabled	CC0
		1F9	Enabled	FFF

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /19,3,2

PF: 3=Quit 5=Refresh 7=Back 8=Fwd 12=Test Menu

Figure 455. 3174 Bridge Port Information for Token-Ring

1 The Peer port has not been defined in the customization of the 3174. This port cannot be given a segment number via LNM or RAS Test.

2 CC0 is the segment defined for the frame relay network.

3 On DLCI X'1F9' or decimal 505, the bridge partner has defined segment number FFF for the frame relay segment. In this case an extra hop is introduced and needs to be considered.

Note: This is only a temporary test to see the effect of different segment numbers. In reality we have used the same segment number for the frame relay network in both 3174 bridges, which is the recommended operation for best performance. The definition for the 3174-13R is shown in Figure 444 on page 373.

20.1.16.11 Verification of the Source Routes

OS2PING visualizes the path taken through the network to verify the network topology depicted in the configuration diagram shown in Figure 416 on page 356.

Source Route from WS-C to MVS

```
{E:\}os2ping a=400001090001 -r
(C) IBM Corporation 1990

OS2PING Version 0.06 - 09/01/92

OS2PING: First response received
OS2PING: Addr=400001090001 Route was:
(cc1) 7 -> (cc0) 5 -> (ffa) e -> (582) 3 -> (bb2)
```

Source Route from WS-C to WS-A

```
{E:\}os2ping a=400000032241 -r
      (C) IBM Corporation 1990

OS2PING Version 0.06 - 09/01/92

OS2PING: First response received
OS2PING: Addr=400000032241 Route was:
(cc1) 7 -> (cc0) 5 -> (ffa) e -> (582) 4 -> (bb3)
```

Source Route from WS-C to WS-D

```
{E:\}os2ping a=40003174ff00 -r
      (C) IBM Corporation 1990

OS2PING Version 0.06 - 09/01/92

OS2PING: First response received
OS2PING: Addr=40003174ff00 Route was:
(cc1) 7 -> (cc0) 7 -> (ccf)
```

Source Route from WS-A to MVS

```
OS2 C:\>OS2PING -a=400001090001 -r
      (C) IBM Corporation 1990

OS2PING Version 0.06 - 09/01/92

OS2PING: First response received
OS2PING: Addr=400001090001 Route was:
(bb3) 4 -> (582) 3 -> (bb2)
```

Source Route from WS-A to WS-D

```
OS2 C:\>OS2PING -a=40003174ff00 -r
      (C) IBM Corporation 1990

OS2PING Version 0.06 - 09/01/92

OS2PING: Addr=40003174ff00 Route was:
(bb3) 4 -> (582) e -> (ffa) 5 -> (cc0) 7 -> (ccf)
```

20.1.16.12 APPC Sessions Display

For the 3174s we show the CP-CP sessions to the adjacent nodes and the sessions from the workstations through the 3174s.

For the workstations we show the links and the LU6.2 sessions which have been established. VTAM displays verify the active 3270 sessions to the NetView application in RAI.

Links to Adjacent Nodes - 3174-13R

Adjacent Nodes							
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
2	USIBMRA	RAI	NN	OPEN	08	1	YES
10	USIBMRA	CP31745	NN	OPEN	08	1	YES
11	USIBMRA	CM41992	EN	OPEN	08	2	YES

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /17,2
4729-Enter the LINKID to run Link Status Test
PF: 3=Quit 5=Refresh 12=Test Menu

Figure 456. CP-CP Sessions to Adjacent Nodes

The 3174-13R established its CP-CP sessions to VTAM (RAI) and the 3174-43R (CP31745) over the frame relay link. The frames sent are in the bridged frame format using RFC 1490 encapsulation.

WS-C has a CP-CP session to the 3174 as NNS. WS-D is not seen here, because its NNS is RAI.

Intermediate LU6.2 Sessions through 3174-13R

Session Status							
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	D90BCEBB8213ED87	USIBMRA	CM42992	ACTIVE	00	CM42992	CM41992
2	CF2FAC3075386BDF	USIBMRA	CM41992	ACTIVE	00	CM41992	CM32241

To go directly to other tests, enter: /Test,Option
Select Option; press ENTER ==> /17,4
4730-Enter the NUM to run the Pending Session Route Test
PF: 3=Quit 5=Refresh 12=Test Menu

Figure 457. Intermediate Session Status Display Panel

1 This is the APPC session of WS-D, which is the originating LU (OLU) to WS-C, which is the destination LU (DLU) passing through the 3174-13R.

2 WS-C (OLU) established an APPC session to WS-A (DLU).

Links to Adjacent Nodes - 3174-43R

BKBCP262	Adjacent Nodes						PU/P31745
LINKID	NETID	CPNAME	Type	Status	State	Num Sess	CP-CP
2	USIBMRA	RAI	NN	OPEN	08	1	YES
10	USIBMRA	CP31742	NN	OPEN	08	1	YES
11	USIBMRA	CM32241	EN	OPEN	08	2	YES

4729-Enter the LINKID to run Link Status Test
CMD==> /17,2

Figure 458. CP-CP Sessions to Adjacent Nodes

A similar situation can be seen here as before on the 3174-13R. The CP-CP sessions CP31742 (3174-13R) and CM32241 (WS-A) exist to RAI.

Intermediate LU6.2 Sessions through 3174-43R

BKBCP264	Session Status						PU/P31745
Num	PCID	NETID	CPNAME	Status	ST	OLU	DLU
1	D90BCEBB8713ED87	USIBMRA	CM42992	ACTIVE	00	CM42992	CM32241
2	EEFFC38B990AF6C3	USIBMRA	CM32241	ACTIVE	00	CM32241	CM41992

4730-Enter the NUM to run the Pending Session Route Test
CMD==> /17,4

Figure 459. Intermediate Session Status Display Panel

At this point in time, APPC sessions exist through the 3174-43R from CM42992 (WS-D) to CM32241 (WS-A) and CM32241 (WS-A) to CM41992 (WS-C).

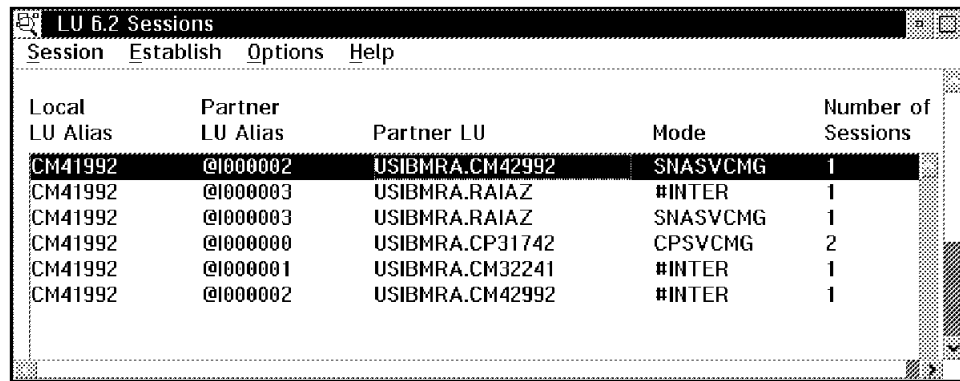
Logical Links - WS-C

Logical Links					
Link Options Help					
Link Name	Partner Network ID	Partner Name	Partner Type	Active Sessions	Link Status
LINK3174	USIBMRA	CP31742	NN	6	Active
RAI01	USIBMRA	RAI	LEN	4	Active

Figure 460. Logical Links, WS-C

WS-C has an APPN link for the CP-CP session to its NNS CP31742 (3174-13R) and an LEN link for the 3270 Sessions to RAI.

LU6.2 Sessions - WS-C

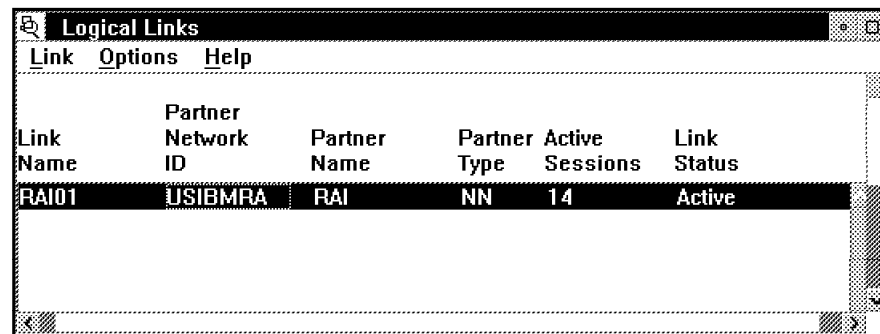


Local LU Alias	Partner LU Alias	Partner LU	Mode	Number of Sessions
CM41992	@I000002	USIBMRA.CM42992	SNASVCMG	1
CM41992	@I000003	USIBMRA.RAIAZ	#INTER	1
CM41992	@I000003	USIBMRA.RAIAZ	SNASVCMG	1
CM41992	@I000000	USIBMRA.CP31742	CPSVCMG	2
CM41992	@I000001	USIBMRA.CM32241	#INTER	1
CM41992	@I000002	USIBMRA.CM42992	#INTER	1

Figure 461. LU6.2 Sessions, WS-C

APPC sessions to RAI (VTAM application), WS-A and WS-D recognized by the mode #INTER, and CP-CP sessions with mode CPSVCMG to its NNS - CP31742 (3174-13R) have been established. As expected, APPN connectivity exists as in the previously routed network.

Logical Links - WS-D

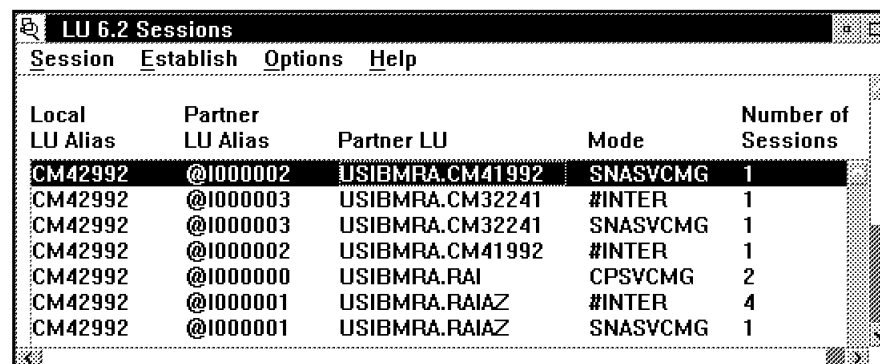


Link Name	Partner Network ID	Partner Name	Partner Type	Active Sessions	Link Status
RAI01	USIBMRA	RAI	NN	14	Active

Figure 462. Logical Links, WS-D

WS-D as 3174 Peer device uses a single, combined APPN/SNA link to RAI as its NNS. If it is required to use the 3174 as NNS, then two links must be defined (an APPN link to the 3174 and a host link to RAI for the 3270 sessions).

LU6.2 Sessions - WS-D



Local LU Alias	Partner LU Alias	Partner LU	Mode	Number of Sessions
CM42992	@I000002	USIBMRA.CM41992	SNASVCMG	1
CM42992	@I000003	USIBMRA.CM32241	#INTER	1
CM42992	@I000003	USIBMRA.CM32241	SNASVCMG	1
CM42992	@I000002	USIBMRA.CM41992	#INTER	1
CM42992	@I000000	USIBMRA.RAI	CPSVCMG	2
CM42992	@I000001	USIBMRA.RAIAZ	#INTER	4
CM42992	@I000001	USIBMRA.RAIAZ	SNASVCMG	1

Figure 463. LU6.2 Sessions, WS-D


```
C RAIAN      DISPLAY NET,ID=P9WSC,SCOPE=ALL
  RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN

IST075I NAME = P9WSC                      , TYPE = PU_T2.1
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = CM41992 , CP NETID = USIBMRA , DYNAMIC LU = YES
IST1105I RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I P9WSC AC/R 21 YES 902D0000000000000000000017100808080
IST136I SWITCHED SNA MAJOR NODE = SW3174BR
IST081I LINE NAME = J0009027, LINE GROUP = EG09L01 , MAJNOD = RA9FRLY
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST355I LOGICAL UNITS:
IST080I S9WSC02 ACT/S
IST080I CM41992 ACT/S----Y
IST314I END
```

VTAM Display for WS-D

```

C RAIAN      DISPLAY NET,ID=P9WSD,SCOPE=ALL
RAIAN      IST097I  DISPLAY  ACCEPTED
' RAIAN
IST075I  NAME = P9WSD                      , TYPE = PU_T2.1
IST486I  STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I  CP NAME = CM42992 , CP NETID = USIBMRA , DYNAMIC LU = YES
IST1105I  RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I  P9WSD  AC/R  21 YES  982D0000000000000000000017100808080
IST136I  SWITCHED SNA MAJOR NODE = SW3174BR
IST081I  LINE NAME = J000902D, LINE GROUP = EG09L01 , MAJNOD = RA9FRLY
IST654I  I/O TRACE = OFF, BUFFER TRACE = OFF
IST355I  LOGICAL UNITS:
IST080I  S9WSD02  ACT/S
IST080I  CM42992  ACT/S----Y
IST314I  END

```

Chapter 20. 3174 APPN with Peer Communications and Bridging **387**

Chapter 21. 3174 CSCM Using NetView Distribution Manager/2

This scenario illustrates the use of the NetView DM/2 as a remote administrator workstation of 3174 CSCM network and central site controllers using APPN and an independent LU 6.2 session. We retrieve the microcode and microcode customization data from the central site 3174, and then send and install it on the network site 3174.

NetView DM/2 2.1 supports the IBM 3174, running 3174 Establishment Controller Configuration Support-C Licensed Internal Code (LIC) and Central Site Change Management (CSCM), as a remote destination for change management.

21.1 Configuration

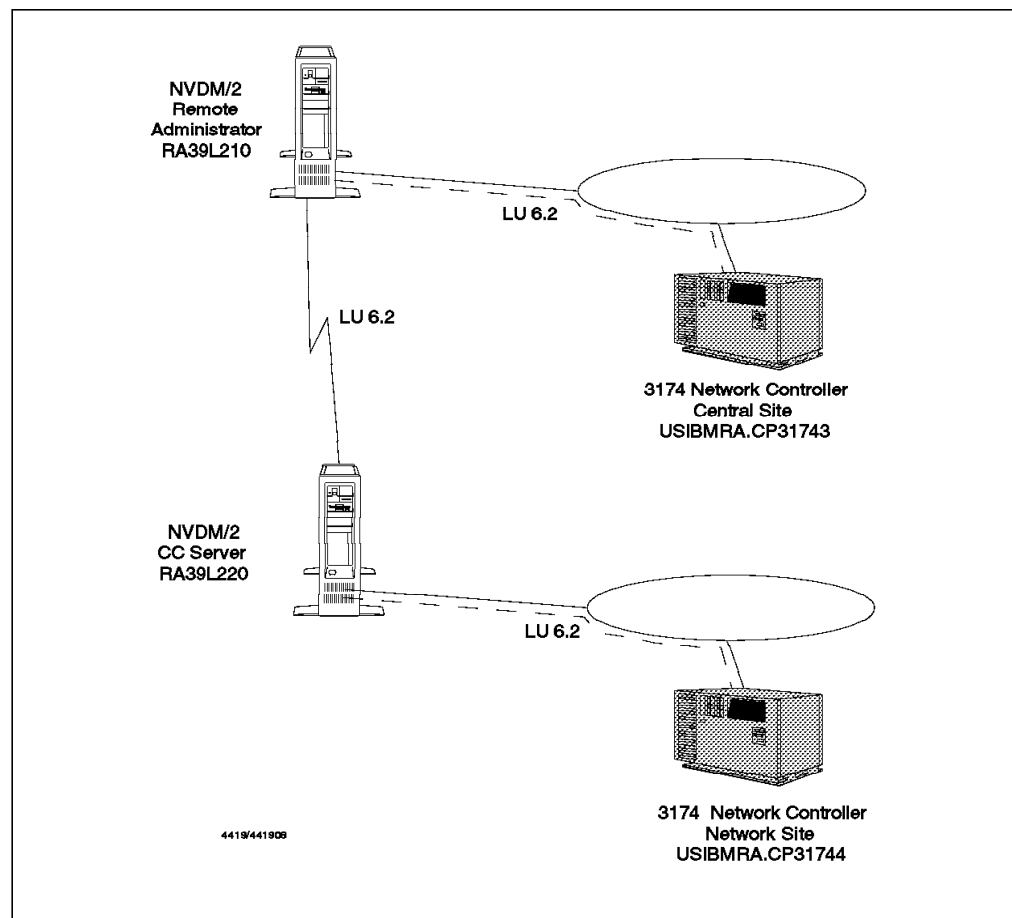


Figure 468. NetView DM/2 Remote Administrator and 3174 Establishment Network Controller

21.2 Definition Overview

In our scenario we have two 3174s and two NetView DM/2 CC servers (change control). The central site 3174 and the remote administrator workstation represent the central site; the remote CC server and the network site stand for any remote destination. The remote CC server is configured as a *distribution intermediate node* for the network site 3174. The distribution intermediate node accepts all requests from the CC server, stores data, and distributes requests and data destined for the 3174 network site controller.

A NetView DM/2 distribution intermediate node is not the same as an APPN intermediate node. The intermediate node, in this case, has more to do with data management and routing and less to do with network routing.

We retrieve the microcode and microcode customization data from the central site 3174 to the remote administrator workstation. We send and install the objects from the remote administrator workstation, forwarding the requests to the distribution intermediate node, on the network site 3174.

The pages to follow describe how to customize NetView DM/2 and the 3174. To install this scenario, perform the following steps:

- Prepare the remote administrator workstation RA39L210.
- Prepare the CC server RA39L220.
- Prepare the 3174 Establishment Network Controller CP31743 (central site).
- Prepare the 3174 Establishment Network Controller CP31744 (network site).

21.3 NetView DM/2 Definitions

Before you begin to install NetView DM/2, some tasks are required to prepare the remote administrator workstation (RA39L210) and the CC server (RA39L220).

21.3.1 User Profile Management Considerations

You need SYSADM authority (highest level of authority) to create and erase a database. If you have local administrator or administrator status in user profile management, then you are automatically given SYSADM authority for database manager databases. Check the STARTUP.CMD file after NetView DM/2 installation for the correct LOGON statement.

21.3.2 LAPS NetBIOS Support

NetBIOS is the protocol used to support sessions between a CC server and CC clients. The following NetBIOS resources should be defined in your PROTOCOL.INI file and they depend on the number of clients concurrently processed by a CC server. See the *NetView DM/2 Installation and Customization Guide*, SH19-6915, and the sample file in Figure 469 on page 391 for more information.

- NetAddress

The address of the remote administrator workstation (4000000CC210). It is used as the DESTINATION_ADDRESS in the DEFINE_LOGICAL_LINK statement in the Communications Manager/2 NDF file for remote CC server (RA39L220) and on the Network Resources panel of the 3174 central site controller in this scenario.

The address of the CC server is 4000000CC220. This address is be used on the Network Resources panel of 3174 network site controller in this scenario.

- Sessions

The number of sessions depends on the number of clients defined in IBMNVD2.INI. See *NetView DM/2 Installation and Customization Guide*, SH19-6915, and *OS/2 System Software Distribution and Installation Using NetView DM/2*, GG66-3253 for more information on how to calculate the required NetBIOS values.

- Commands

The number of commands depends on the number of maximum requests defined in IBMNVD2.INI.

- Selectors (GDT)

The GDT Selector keyword in PROTOCOL.INI should be set to at least 10. If you are planning on doing concurrent installation to many clients, we recommend that the GDT selectors be set to 30.

The PROTOCOL.INI files for the remote administrator workstation (RA39L210) and the CC server (RA39L220) are shown in Figure 469 and Figure 470 on page 393, respectively.

PROTOCOL.INI for Remote Administrator Workstation (RA39L210)

```
[PROT_MAN]

DRIVERNAME = PROTMAN$

[IBMLXCFG]

landd_nif = landd.nif
netbeui_nif = netbeui.nif
IBMTOK_nif = IBMTOK.nif

[landd_nif]

DriverName = LANDD$
Bindings = IBMTOK_nif
NETADDRESS = "T4000000CC210"
ETHERAND_TYPE = "D"
SYSTEM_KEY = 0x0
OPEN_OPTIONS = 0x2000
TRACE = 0x0
LINKS = 8
MAX_SAPS = 3
MAX_G_SAPS = 0
USERS = 3
T1_TICK_G1 = 255
T1_TICK_G1 = 15
T2_TICK_G1 = 3
T1_TICK_G2 = 255
T1_TICK_G2 = 25
T2_TICK_G2 = 10
IPACKETS = 250
UIPACKETS = 100
MAXTRANSMITS = 6
MINTRANSMITS = 2
TCBS = 64
GDTS = 30
ELEMENTS = 800
```

Figure 469 (Part 1 of 2). LAN Adapter and Protocol Support PROTOCOL.INI File (Remote Administrator Workstation)

```

[netbeui_nif]

DriverName = netbeui$
Bindings = IBMTOK_nif
ETHERAND_TYPE = "D"
USEADDRREV = "YES"
OS2TRACEMASK = 0x0
SESSIONS = 220
NCBS = 200
NAMES = 100
SELECTORS = 30
USEMAXDATAGRAM = "NO"
ADAPTRATE = 1000
WINDOWERRORS = 0
MAXDATARC = 4168
TI = 30000
T1 = 500
T2 = 400
MAXIN = 1
MAXOUT = 1
NETBIOS_TIMEOUT = 500
NETBIOS_RETRIES = 8
NAMECACHE = 0
PIGGYBACKACKS = 1
DATAGRAM_PACKETS = 2
PACKETS = 350
LOOP_PACKETS = 1
PIPELINE = 5
MAX_TRANSMITS = 6
MIN_TRANSMITS = 2
DLC_RETRIES = 5
FC_PRIORITY = 5
NET_FLAGS = 0x0

[IBMTOK_nif]

DriverName = IBMTOK$
ADAPTER = "PRIMARY"
MAX_TRANSMITS = 12
RECV_BUFS = 10
RECV_BUF_SIZE = 1024
XMIT_BUFS = 2
XMIT_BUF_SIZE = 1024

```

Figure 469 (Part 2 of 2). LAN Adapter and Protocol Support PROTOCOL.INI File (Remote Administrator Workstation)

PROTOCOL.INI for CC server (RA39L220)

```
[PROT_MAN]
  DRIVERNAME = PROTMAN$

[IBMLXCFG]
  landd_nif = landd.nif
  netbeui_nif = netbeui.nif
  IBMTOK_nif = IBMTOK.nif

[landd_nif]
  DriverName = LANDD$
  Bindings = IBMTOK_nif
  NETADDRESS = "T4000000CC220"
  ETHERAND_TYPE = "D"
  SYSTEM_KEY = 0x0
  OPEN_OPTIONS = 0x2000
  TRACE = 0x0
  LINKS = 8
  MAX_SAPS = 3
  MAX_G_SAPS = 0
  USERS = 3
  T1_TICK_G1 = 255
  T1_TICK_G1 = 15
  T2_TICK_G1 = 3
  T1_TICK_G2 = 255
  T1_TICK_G2 = 25
  T2_TICK_G2 = 10
  IPACKETS = 250
  UIPACKETS = 100
  MAXTRANSMITS = 6
  MINTRANSMITS = 2
  TCBS = 64
  GDTS = 30
  ELEMENTS = 800

[netbeui_nif]
  DriverName = netbeui$
  Bindings = IBMTOK_nif
  ETHERAND_TYPE = "D"
  USEADDRREV = "YES"
  OS2TRACEMASK = 0x0
  SESSIONS = 220
  NCBS = 200
  NAMES = 100
  SELECTORS = 30
  USEMAXDATAGRAM = "NO"
  ADAPTRATE = 1000
  WINDOWERRORS = 0
  MAXDATARCV = 4168
  TI = 30000
  T1 = 500
  T2 = 400
  MAXIN = 1
  MAXOUT = 1
  NETBIOS_TIMEOUT = 500
  NETBIOS_RETRIES = 8
  NAMECACHE = 0
  PIGGYBACKACKS = 1
  DATAGRAMPACKETS = 2
  PACKETS = 350
  LOOPPACKETS = 1
  PIPELINE = 5
  MAXTRANSMITS = 6
  MINTRANSMITS = 2
  DLCRETRIES = 5
  FCPRIORITY = 5
  NETFLAGS = 0x0

[IBMTOK_nif]
  DriverName = IBMTOK$
  ADAPTER = "PRIMARY"
  MAXTRANSMITS = 12
  RECVBUFS = 10
  RECVBUFSIZE = 1024
  XMITBUFS = 2
  XMITBUFSIZE = 1024
```

Figure 470. LAN Adapter and Protocol Support PROTOCOL.INI File (CC Server)

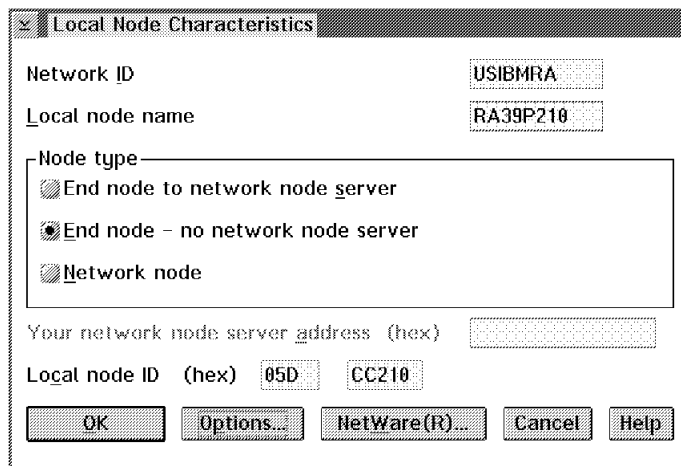
21.3.3 Prepare NetView DM/2 Workstations

21.3.3.1 Customize Communications Manager/2 for Remote Administrator Workstation

Customize the APPC connections to the remote CC server RA39L220 and to the central site 3174 controller CP31743. See the sample NDF file in Figure 480 on page 399. The following CM/2 profiles must be created or updated:

- SNA base profile

Insert Network Name (USIBMRA), Local CP Name (RA39P210) and automatically activate the APPC attach manager. See the following window:

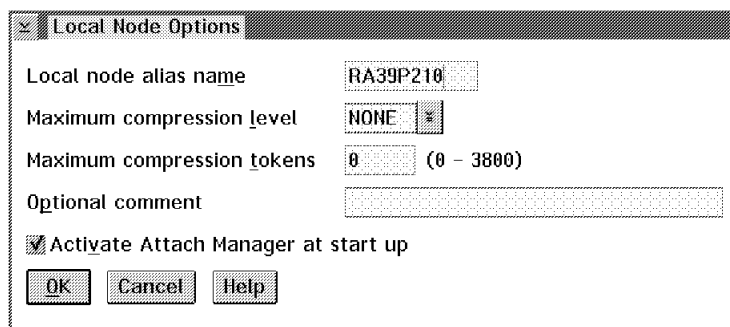


The 'Local Node Characteristics' dialog box contains the following fields and options:

- Network ID:** Text box containing 'USIBMRA'.
- Local node name:** Text box containing 'RA39P210'.
- Node type:** A group box containing three radio buttons:
 - ☐ End node to network node server
 - ☒ End node - no network node server
 - ☐ Network node
- Your network node server address (hex):** Empty text box.
- Local node ID (hex):** Two text boxes containing '05D' and 'CC210'.
- Buttons:** 'OK', 'Options...', 'NetWare(R)...', 'Cancel', and 'Help'.

Figure 471. The Local Node Characteristics Window

Insert the Network ID, Local node name and specify the node type; then select **Options**. The following window will appear:



The 'Local Node Options' dialog box contains the following fields and options:

- Local node alias name:** Text box containing 'RA39P210'.
- Maximum compression level:** Dropdown menu set to 'NONE'.
- Maximum compression tokens:** Text box containing '0' with a range '(0 - 3800)'.
- Optional comment:** Empty text box.
- Activate Attach Manager at start up:** Checked checkbox.
- Buttons:** 'OK', 'Cancel', and 'Help'.

Figure 472. The Local Node Options Window

- SNA Connections profile

Define the links to workstation RA39L220 and the central site 3174 Establishment Network Controller CP31743. See the following window:

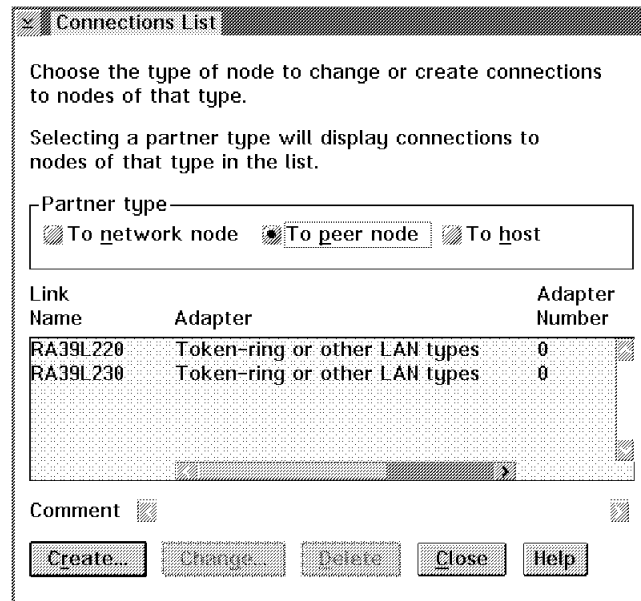


Figure 473. The Connections List Window

Select the partner type for the connection:

- To peer node
Select **To peer node** when you define a link to another CC server that is not defined as a network node.
- To host
Select **To host** when you define a link to a NetView DM/MVS host focal point.
- To network node
Select **To network node** when you define a link to, for example, a 3174 Establishment Network Controller in a local LAN that is configured as a network node.

Insert the network ID and node name of the partner. See the following window:

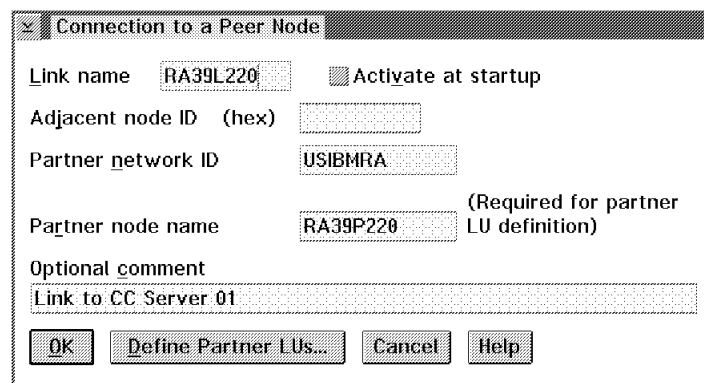


Figure 474. The Connection to a Peer Node Window

- SNA Features profile
 - Define the partner LUs for RA39L220 and CP31743.

Figure 475. The Partner LU Window

Note: A partner LU for the network site 3174 controller (CP31744) is not needed, because the remote CC server (RA39L220) acts as an distribution intermediate node.

Insert the network ID and LU name of the partner and specify an alias for this partner LU, for each partner (RA39L220 and CP31743).

- Define an independent local LU RA39L210

Figure 476. The Local LU Window

Insert the LU name and LU alias and define this local LU as independent.

Note: If you do not explicitly define a local LU, Communications Manager/2 will generate one with the same name as the local CP name.

- Define a log mode called LU62.

The screenshot shows a 'Mode Definition' dialog box with the following fields and values:

- Mode name:** LU62
- Class of service:** #CONNECT
- Mode session limit:** 1 (range 0 - 32767)
- Minimum contention winners:** 0 (range 0 - 32767)
- Receive pacing window:** 4 (range 0 - 63)
- Compression section:**
 - Compression need:** PROHIBITED
 - PLU->SLU compression level:** NONE
 - SLU->PLU compression level:** NONE
- RU size section:**
 - ☐ Default RU size
 - ☒ Maximum RU size: 256 (range 256 - 16384)
- Optional comment:** LU6.2 Mode
- Buttons:** OK, Cancel, Help

Figure 477. The Mode Definition Window

The session limit for log mode that you use for the LU6.2 communication *must always* be 1, since NetView DM/MVS and NetView DM/2 support only single session communication.

- The default mode #BATCH is used between the CC servers and the 3174s. You can also define, for example, the log mode LU62 on the 3174s and use this instead. We use the mode #BATCH because it is an IBM default that is available in all APPN products.

The session limit for LU 6.2 transmission service mode profile *must always* be 1, since NetView DM/MVS and NetView DM/2 support only single session communication.

– Define Transaction Programs.

- SEND TP
- RECEIVE TP

Select the following windows to define the transaction programs:

The image shows a 'Transaction Program Definition' dialog box. It has a title bar with a minimize icon and the text 'Transaction Program Definition'. Inside, there are two main sections. The first section, 'Transaction program definition', contains a checked checkbox for 'Service TP', a text field for 'Transaction program (TP) name' with the value 'x'21'007', a text field for 'OS/2 program path and file name' with the value 'C:\IBMNVDM2\BIN\ANXSNADS', and a text field for 'Optional comment' with the value 'Send TP'. The second section, 'Optional values', contains a checked checkbox for 'Conversation security required', an empty text field for 'Program parameter string', and an empty text field for 'Icon path and file name'. At the bottom are three buttons: 'Continue...', 'Cancel', and 'Help'.

Figure 478. The Transaction Program Window (SEND)

The image shows a 'Transaction Program Definition' dialog box, similar to the one in Figure 478. It has a title bar with a minimize icon and the text 'Transaction Program Definition'. Inside, there are two main sections. The first section, 'Transaction program definition', contains a checked checkbox for 'Service TP', a text field for 'Transaction program (TP) name' with the value 'x'21'008', a text field for 'OS/2 program path and file name' with the value 'C:\IBMNVDM2\BIN\ANXSNADS', and a text field for 'Optional comment' with the value 'Receive TP'. The second section, 'Optional values', contains a checked checkbox for 'Conversation security required', an empty text field for 'Program parameter string', and an empty text field for 'Icon path and file name'. At the bottom are three buttons: 'Continue...', 'Cancel', and 'Help'.

Figure 479. The Transaction Program Window (RECEIVE)

- SNA Defaults

Insert the DEFAULT_LOCAL_LU_ALIAS(RA39L210) to the DEFAULT_DEFAULTS section in the NDF File.

Network Definition File (NDF) for Remote Administrator Workstation (RA39L210)

```
DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.RA39P210 )
                  CP_ALIAS(RA39P210)
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN)
                  NODE_ID(X'05DCC210')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  HOST_FP_LINK_NAME(HOST$1  )
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(RA39P220)
                    DESCRIPTION(Link to CC-Server - RA39P220)
                    FQ_ADJACENT_CP_NAME(USIBMRA.RA39P220 )
                    ADJACENT_NODE_TYPE(LEN)
                    DLC_NAME(IBMTRNET)
                    ADAPTER_NUMBER(0)
                    DESTINATION_ADDRESS(X' 4000000CC22004')
                    ETHERNET_FORMAT(NO)
                    CP_CP_SESSION_SUPPORT(NO)
                    ACTIVATE_AT_STARTUP(YES)
                    LIMITED_RESOURCE(NO)
                    LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                    SOLICIT_SSCP_SESSION(NO)
                    MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                    USE_PUNAME_AS_CPNAME(NO)
                    EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                    COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                    COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                    SECURITY(USE_ADAPTER_DEFINITION)
                    PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_3(USE_ADAPTER_DEFINITION);
```

Figure 480 (Part 1 of 3). Communications Manager Network Definition File (Remote Administrator Workstation)

```

DEFINE_LOGICAL_LINK LINK_NAME(LNK31743)
                     DESCRIPTION(Link to 3174 - Central Site)
                     ADJACENT_NODE_TYPE(NN)
                     PREFERRED_NN_SERVER(NO)
                     DLC_NAME(IBMTRNET)
                     ADAPTER_NUMBER(0)
                     DESTINATION_ADDRESS(X' 40003174000304')
                     ETHERNET_FORMAT(NO)
                     CP_SESSION_SUPPORT(YES)
                     ACTIVATE_AT_STARTUP(YES)
                     LIMITED_RESOURCE(NO)
                     LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                     SOLICIT_SSCP_SESSION(NO)
                     MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                     USE_PUNAME_AS_CPNAME(NO)
                     EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                     COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                     COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                     SECURITY(USE_ADAPTER_DEFINITION)
                     PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_LOCAL_LU LU_NAME(RA39L210)
                DESCRIPTION(Local LU)
                LU_ALIAS(RA39L210)
                NAU_ADDRESS(INDEPENDENT_LU);

DEFINE_PARTNER_LU FQ_PARTNER_LU_NAME(USIBMRA.RA39L220 )
                  DESCRIPTION(CC Server 01)
                  PARTNER_LU_ALIAS(RA39L220)
                  PARTNER_LU_UNINTERPRETED_NAME(RA39L220)
                  MAX_MC_LL_SEND_SIZE(32767)
                  CONV_SECURITY_VERIFICATION(NO)
                  PARALLEL_SESSION_SUPPORT(YES);

DEFINE_PARTNER_LU FQ_PARTNER_LU_NAME(USIBMRA.CP31743 )
                  DESCRIPTION(3174 Controller - Central Site)
                  PARTNER_LU_ALIAS(CP31743)
                  PARTNER_LU_UNINTERPRETED_NAME(CP31743)
                  MAX_MC_LL_SEND_SIZE(32767)
                  CONV_SECURITY_VERIFICATION(NO)
                  PARALLEL_SESSION_SUPPORT(NO);

DEFINE_PARTNER_LU_LOCATION FQ_PARTNER_LU_NAME(USIBMRA.RA39L220 )
                           WILDCARD_ENTRY(NO)
                           FQ_OWNING_CP_NAME(USIBMRA.RA39P220 )
                           LOCAL_NODE_NN_SERVER(NO);

```

Figure 480 (Part 2 of 3). Communications Manager Network Definition File (Remote Administrator Workstation)

```

DEFINE_MODE MODE_NAME(LU62 )
        DESCRIPTION(LU6.2 Mode)
        COS_NAME(#CONNECT)
        DEFAULT_RU_SIZE(NO)
        MAX_RU_SIZE_UPPER_BOUND(4096)
        RECEIVE_PACING_WINDOW(4)
        MAX_NEGOTIABLE_SESSION_LIMIT(32767)
        PLU_MODE_SESSION_LIMIT(1)
        MIN_CONWINNERS_SOURCE(0)
        COMPRESSION_NEED(PROHIBITED)
        PLU_SLU_COMPRESSION(NONE)
        SLU_PLU_COMPRESSION(NONE);

DEFINE_MODE MODE_NAME(#BATCH )
        DESCRIPTION(3174 Mode)
        COS_NAME(#CONNECT)
        DEFAULT_RU_SIZE(YES)
        RECEIVE_PACING_WINDOW(3)
        MAX_NEGOTIABLE_SESSION_LIMIT(32767)
        PLU_MODE_SESSION_LIMIT(1)
        MIN_CONWINNERS_SOURCE(0)
        COMPRESSION_NEED(PROHIBITED)
        PLU_SLU_COMPRESSION(NONE)
        SLU_PLU_COMPRESSION(NONE);

DEFINE_DEFAULTS IMPLICIT_INBOUND_PLU_SUPPORT(YES)
        DEFAULT_MODE_NAME(BLANK)
        DEFAULT_LOCAL_LU_ALIAS(RA39L210)
        MAX_MC_LL_SEND_SIZE(32767)
        DIRECTORY_FOR_INBOUND_ATTACHES(*)
        DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
        DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
        DEFAULT_TP_CONV_SECURITY_RQD(NO)
        MAX_HELD_ALERTS(10);

DEFINE_TP SNA_SERVICE_TP_NAME(X'21',007)
        DESCRIPTION(Send TP)
        PIP_ALLOWED(NO)
        FILESPEC(C:\IBMNVDM2\BIN\ANXSNADS.EXE)
        CONVERSATION_TYPE(ANY_TYPE)
        CONV_SECURITY_RQD(NO)
        SYNC_LEVEL(EITHER)
        TP_OPERATION(QUEUED_OPERATOR_STARTED)
        PROGRAM_TYPE(BACKGROUND)
        INCOMING_ALLOCATE_QUEUE_DEPTH(255)
        INCOMING_ALLOCATE_TIMEOUT(INFINITE)
        RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

DEFINE_TP SNA_SERVICE_TP_NAME(X'21',008)
        DESCRIPTION(Receive TP)
        PIP_ALLOWED(NO)
        FILESPEC(C:\IBMNVDM2\BIN\ANXSNADS.EXE)
        CONVERSATION_TYPE(ANY_TYPE)
        CONV_SECURITY_RQD(NO)
        SYNC_LEVEL(EITHER)
        TP_OPERATION(QUEUED_OPERATOR_STARTED)
        PROGRAM_TYPE(BACKGROUND)
        INCOMING_ALLOCATE_QUEUE_DEPTH(255)
        INCOMING_ALLOCATE_TIMEOUT(INFINITE)
        RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

START_ATTACH_MANAGER;

```

Figure 480 (Part 3 of 3). Communications Manager Network Definition File (Remote Administrator Workstation)

21.3.3.2 Customize Communications Manager/2 for CC server

Customize the APPC connections to remote administrator workstation RA39L210 and to the 3174 controller CP31744 (network site). See the sample NDF file in Figure 481 on page 403.

The following CM/2 profiles must be created or updated:

- SNA base profile

Insert the Network Name (USIBMRA) and Local CP Name (RA39P220) and automatically activate the APPC attach manager.

- SNA connections profile

Define the link to remote administrator workstation RA39L210 and to the network site 3174 controller CP31744.

- SNA Features profile

- Define the partner LUs RA39L210 and CP31744.
- Define an independent local LU RA39L220.
- Define a Mode called LU62 to be used between the remote administrator and the remote CC server.

The session limit for the LU 6.2 transmission service mode profile *must always* be 1, since NetView DM/MVS and NetView DM/2 support only single session communication.

- The default mode #BATCH is used between the CC servers and the 3174s. You can also define, for example, the log mode LU62 on the 3174s and use this instead. We use the mode #BATCH because it is an IBM default that is available in all APPN products.

The session limit for LU 6.2 transmission service mode profile *must always* be 1, since NetView DM/MVS and NetView DM/2 support only single session communication.

- Define transaction programs.

- SNA Defaults

Insert the DEFAULT_LOCAL_LU_ALIAS (RA39L220) in the DEFAULT_DEFAULTS section of the NDF File.

Network Definition File (NDF) for CC Server (RA39L220)

```
DEFINE_LOCAL_CP  FQ_CP_NAME(USIBMRA.RA39P220 )
                  CP_ALIAS(RA39P220)
                  NAU_ADDRESS(INDEPENDENT_LU)
                  NODE_TYPE(EN)
                  NODE_ID(X'05DCC220')
                  NW_FP_SUPPORT(NONE)
                  HOST_FP_SUPPORT(YES)
                  HOST_FP_LINK_NAME(HOST$1  )
                  MAX_COMP_LEVEL(NONE)
                  MAX_COMP_TOKENS(0);

DEFINE_LOGICAL_LINK LINK_NAME(RA39P210)
                    DESCRIPTION(Link to Remote Administrator)
                    FQ_ADJACENT_CP_NAME(USIBMRA.RA39P210 )
                    ADJACENT_NODE_TYPE(LEN)
                    DLC_NAME(IBMTRNET)
                    ADAPTER_NUMBER(0)
                    DESTINATION_ADDRESS(X' 4000000CC21004')
                    ETHERNET_FORMAT(NO)
                    CP_CP_SESSION_SUPPORT(NO)
                    ACTIVATE_AT_STARTUP(YES)
                    LIMITED_RESOURCE(NO)
                    LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                    SOLICIT_SSCP_SESSION(NO)
                    MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                    USE_PUNAME_AS_CPNAME(NO)
                    EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                    COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                    COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                    SECURITY(USE_ADAPTER_DEFINITION)
                    PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                    USER_DEFINED_3(USE_ADAPTER_DEFINITION);
```

Figure 481 (Part 1 of 3). Communications Manager Network Definition File (CC Server)

```

DEFINE_LOGICAL_LINK LINK_NAME(LNK31744)
                     DESCRIPTION(Link to 3174 - Network Site)
                     ADJACENT_NODE_TYPE(NN)
                     PREFERRED_NN_SERVER(NO)
                     DLC_NAME(IBMTRNET)
                     ADAPTER_NUMBER(0)
                     DESTINATION_ADDRESS(X' 40003174000404')
                     ETHERNET_FORMAT(NO)
                     CP_SESSION_SUPPORT(YES)
                     ACTIVATE_AT_STARTUP(YES)
                     LIMITED_RESOURCE(NO)
                     LINK_STATION_ROLE(USE_ADAPTER_DEFINITION)
                     SOLICIT_SSCP_SESSION(NO)
                     MAX_ACTIVATION_ATTEMPTS(USE_ADAPTER_DEFINITION)
                     USE_PUNAME_AS_CPNAME(NO)
                     EFFECTIVE_CAPACITY(USE_ADAPTER_DEFINITION)
                     COST_PER_CONNECT_TIME(USE_ADAPTER_DEFINITION)
                     COST_PER_BYTE(USE_ADAPTER_DEFINITION)
                     SECURITY(USE_ADAPTER_DEFINITION)
                     PROPAGATION_DELAY(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_1(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_2(USE_ADAPTER_DEFINITION)
                     USER_DEFINED_3(USE_ADAPTER_DEFINITION);

DEFINE_LOCAL_LU LU_NAME(RA39L220)
                DESCRIPTION(Local LU)
                LU_ALIAS(RA39L220)
                NAU_ADDRESS(INDEPENDENT_LU);

DEFINE_PARTNER_LU FQ_PARTNER_LU_NAME(USIBMRA.RA39L210 )
                  PARTNER_LU_ALIAS(RA39L210)
                  DESCRIPTION(Remote Administrator)
                  PARTNER_LU_UNINTERPRETED_NAME(RA39L210)
                  MAX_MC_LL_SEND_SIZE(32767)
                  CONV_SECURITY_VERIFICATION(NO)
                  PARALLEL_SESSION_SUPPORT(YES);

DEFINE_PARTNER_LU FQ_PARTNER_LU_NAME(USIBMRA.CP31744 )
                  PARTNER_LU_ALIAS(CP31744)
                  DESCRIPTION(3174 Controller - Network Site)
                  PARTNER_LU_UNINTERPRETED_NAME(CP31744)
                  MAX_MC_LL_SEND_SIZE(32767)
                  CONV_SECURITY_VERIFICATION(NO)
                  PARALLEL_SESSION_SUPPORT(NO);

DEFINE_PARTNER_LU_LOCATION FQ_PARTNER_LU_NAME(USIBMRA.RA39L210 )
                           WILDCARD_ENTRY(NO)
                           FQ_OWNING_CP_NAME(USIBMRA.RA39P210 )
                           LOCAL_NODE_NN_SERVER(NO);

```

Figure 481 (Part 2 of 3). Communications Manager Network Definition File (CC Server)


```

DEFINE_MODE MODE_NAME(LU62 )
        DESCRIPTION(LU6.2 Mode)
        COS_NAME(#CONNECT)
        DEFAULT_RU_SIZE(NO)
        MAX_RU_SIZE_UPPER_BOUND(4096)
        RECEIVE_PACING_WINDOW(4)
        MAX_NEGOTIABLE_SESSION_LIMIT(32767)
        PLU_MODE_SESSION_LIMIT(1)
        MIN_CONWINNERS_SOURCE(0)
        COMPRESSION_NEED(PROHIBITED)
        PLU_SLU_COMPRESSION(NONE)
        SLU_PLU_COMPRESSION(NONE);

DEFINE_MODE MODE_NAME(#BATCH )
        DESCRIPTION(3174 Mode)
        COS_NAME(#CONNECT)
        DEFAULT_RU_SIZE(YES)
        RECEIVE_PACING_WINDOW(3)
        MAX_NEGOTIABLE_SESSION_LIMIT(32767)
        PLU_MODE_SESSION_LIMIT(1)
        MIN_CONWINNERS_SOURCE(0)
        COMPRESSION_NEED(PROHIBITED)
        PLU_SLU_COMPRESSION(NONE)
        SLU_PLU_COMPRESSION(NONE);

DEFINE_DEFAULTS IMPLICIT_INBOUND_PLU_SUPPORT(YES)
        DEFAULT_MODE_NAME(BLANK)
        DEFAULT_LOCAL_LU_ALIAS(RA39L220)
        MAX_MC_LL_SEND_SIZE(32767)
        DIRECTORY_FOR_INBOUND_ATTACHES(*)
        DEFAULT_TP_OPERATION(NONQUEUED_AM_STARTED)
        DEFAULT_TP_PROGRAM_TYPE(BACKGROUND)
        DEFAULT_TP_CONV_SECURITY_RQD(NO)
        MAX_HELD_ALERTS(10);

DEFINE_TP SNA_SERVICE_TP_NAME(X'21',007)
        DESCRIPTION(Send TP)
        PIP_ALLOWED(NO)
        FILESPEC(C:\IBMNVD2\BIN\ANXSNADS.EXE)
        CONVERSATION_TYPE(ANY_TYPE)
        CONV_SECURITY_RQD(NO)
        SYNC_LEVEL(EITHER)
        TP_OPERATION(QUEUED_OPERATOR_STARTED)
        PROGRAM_TYPE(BACKGROUND)
        INCOMING_ALLOCATE_QUEUE_DEPTH(255)
        INCOMING_ALLOCATE_TIMEOUT(INFINITE)
        RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

DEFINE_TP SNA_SERVICE_TP_NAME(X'21',008)
        DESCRIPTION(Receive TP)
        PIP_ALLOWED(NO)
        FILESPEC(C:\IBMNVD2\BIN\ANXSNADS.EXE)
        CONVERSATION_TYPE(ANY_TYPE)
        CONV_SECURITY_RQD(NO)
        SYNC_LEVEL(EITHER)
        TP_OPERATION(QUEUED_OPERATOR_STARTED)
        PROGRAM_TYPE(BACKGROUND)
        INCOMING_ALLOCATE_QUEUE_DEPTH(255)
        INCOMING_ALLOCATE_TIMEOUT(INFINITE)
        RECEIVE_ALLOCATE_TIMEOUT(INFINITE);

START_ATTACH_MANAGER;

```

Figure 481 (Part 3 of 3). Communications Manager Network Definition File (CC Server)

21.3.3.3 Install and Customize NetView DM/2 Using CDM Dialogs

The sample response file is shown in Figure 485 on page 408 and Figure 486 on page 409.

Remote Administrator Workstation (RA39L210)

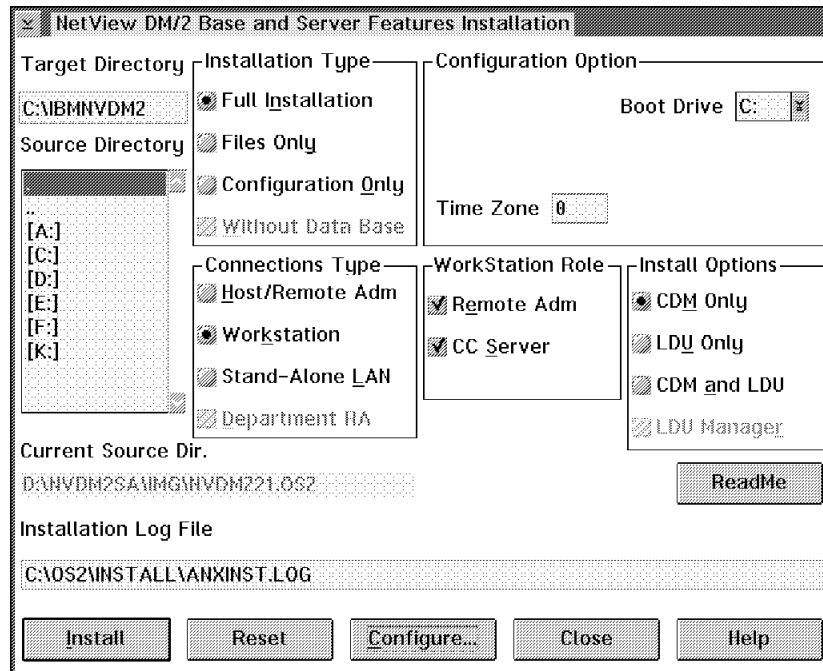


Figure 482. Base and Server Features Installation Window - Remote Administrator

This selection applies to a workstation that is:

1. A remote administrator
2. Acting as a CC server in a LAN with local CC clients
3. Connected by APPC to two CC servers

A typical scenario for this configuration is an APPC-connected environment where the remote administrator workstation manages local CC clients as well as remote CC clients attached to a remote CC server with no NetView DM/MVS host.

Remote Administrator Workstation (RA39L210)

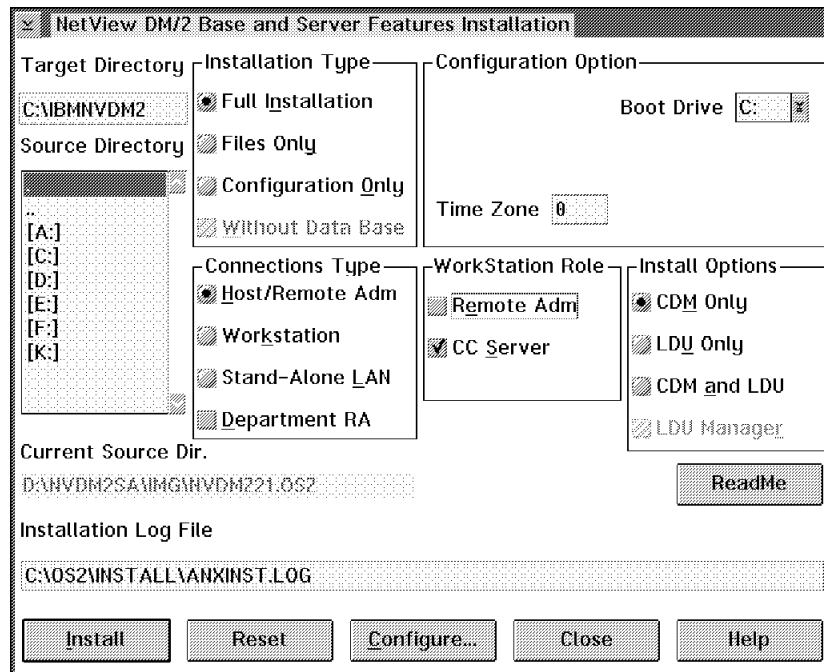


Figure 483. Base and Server Features Installation Window - CC Server

This selection applies to a workstation that is:

1. A CC server with locally attached CC clients
2. APPC-connected to a remote administrator workstation

When you have changed all parameters, select **Configure**.

The NetView DM/2 Base and Server Features Installation (Configuration) window appears.

Figure 484. Base and Server Features Installation Window (Configuration) - CC Server

The FP Network ID and the FP LU Name configuration parameters identify the network ID and the LU name of the focal point or the remote administrator to which the CC server will be connected. From this workstation, the CC server will accept change management requests and will send the reports back.

```

//*****
//*
//*  IBM NetView DM/2 Ver. 2  INI File
//*
//*****

FileserviceDir   = D:\NVDM2FS
SharedDirA      = D:\NVDM2SA
SharedDirB      = D:\NVDM2SB
MaxRequests     = 8
MaxClients      = 10
MaxShrFiles     = 500
AdapterNum      = 0
AgentTimeOut    = -1
TimeZone        = 0
RemoteRetrieve   = ALL
RemoteDelete     = ALL
MessageLogFile   = C:\IBMNVDM2\MESSAGE.DAT
ErrorLogFile     = C:\IBMNVDM2\ERROR.DAT
LogOption        = NVDM
TransformAlgor   = SCB
TransformParam   = " "
RemoteSend       = REPLACE
PollingInterval  = 0
RebootDelay      = 2
AutomaticPurgeReport = NO

//*****

```

Figure 485. NetView DM/2 INI File (Remote Administrator Workstation)

```

//*****
//*
//* IBM NetView DM/2 Ver. 2 INI File
//*
//*****

FileserviceDir      = D:\NVD2FS
SharedDirA          = D:\NVD2SA
SharedDirB          = D:\NVD2SB
MaxRequests         = 8
MaxClients          = 10
MaxShrFiles         = 500
AdapterNum          = 0
AgentTimeOut        = -1
FPNetworkID         = USIBMRA
FPLUName            = RA39L210
RemoteActivation     = YES
RemoteProcInvoc     = YES
RemoteCM            = YES
RemoteSend          = REPLACE
PollingInterval     = 0
UnsolicitedReports  = YES
MessageLogFile      = C:\IBMNVDM2\MESSAGE.DAT
ErrorLogFile        = C:\IBMNVDM2\ERROR.DAT
LogOption           = NVDM
TransformAlgor       = SCB
TransformParam       = " "
TimeZone            = 0
RemoteRetrieve       = ALL
RemoteDelete        = ALL
RebootDelay         = 2
AutomaticPurgeReport = NO

//*****

```

Figure 486. NetView DM/2 INI File (CC Server)

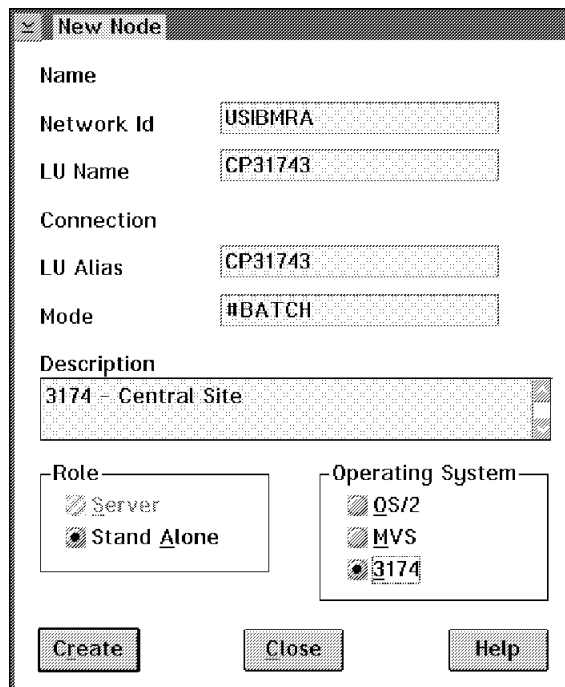
21.3.4 Definition of Remote Destinations

After the installation of the remote administrator workstation and the CC server are completed successfully, you have to define the remote destinations on:

- Remote Administrator Workstation RA39L210
- CC Server RA39L220

21.3.4.1 Define Remote Destinations at Remote Administrator Workstation RA39L210

Open the CDM Remote Destination window and select **New** from the **Nodes** pull-down menu. The following Open Node window shows how to define the 3174 controller (central site) as a remote destination of the remote administrator workstation.



New Node

Name

Network Id: USIBMRA

LU Name: CP31743

Connection

LU Alias: CP31743

Mode: BATCH

Description: 3174 - Central Site

Role:

☐ Server

☒ Stand Alone

Operating System:

☐ OS/2

☐ MVS

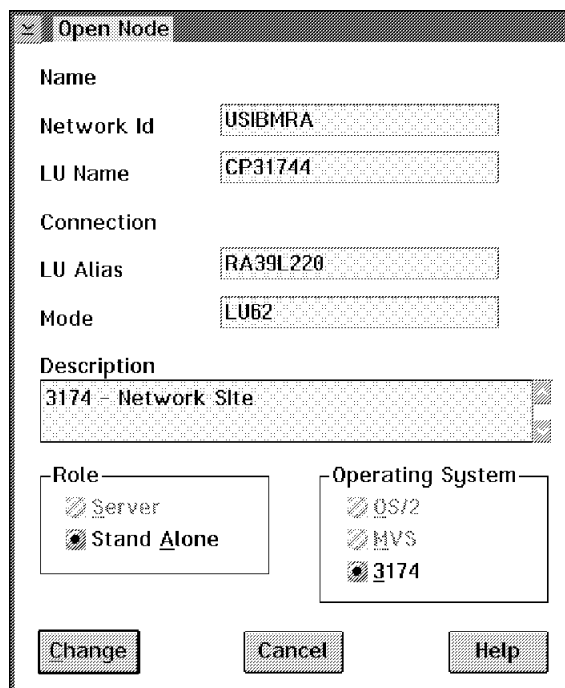
☒ 3174

Create Close Help

Figure 487. The Open Node Window. Define 3174 Controller (Central Site) as a remote destination of the Remote Administrator.

The Name section defines the receiver of the objects and Connection specifies the connection to that node. Both of these are defined to the Communications Manager.

The following New Node window shows how to define the 3174 controller (network site) as a remote destination of the remote CC server.



Open Node

Name

Network Id: USIBMRA

LU Name: CP31744

Connection

LU Alias: RA39L220

Mode: LU62

Description: 3174 - Network Site

Role:

☐ Server

☒ Stand Alone

Operating System:

☐ OS/2

☐ MVS

☒ 3174

Change Cancel Help

Figure 488. The New Node Window. Define 3174 Controller (Network Site) as a remote destination of the Remote Administrator.

We also define the remote CC server as follows:

Figure 489. The New Node Window. Define CC Server 01 as a remote destination of the Remote Administrator.

To define the remote destinations at the remote administrator workstation RA39L210 you can also use the following parameter file:

```
USIBMRA RA39L220 S RA39L220 LU62 0 "Remote CC Server"
USIBMRA CP31743 SA CP31743 #BATCH C "3174 Controller - Central Site"
USIBMRA CP31744 SA RA39L220 LU62 C "3174 Controller - Network Site"
```

Note

Specify the same LU name and Mode (RA39L220.LU62) for the CC server and the 3174 controller (network site), because they use the same connection (intermediate node) to reach the remote destination.

21.3.4.2 Define Remote Destinations at CC Server RA39L220

To define the remote destinations at the remote administrator workstation RA39L210 use the following parameter file:

```
USIBMRA RA39L210 S RA39L210 LU62 0 "Remote Administrator Workstation"
USIBMRA CP31744 SA CP31744 #BATCH C "3174 Controller - Network Site "
```

The configuration of the NetView DM/2 systems remains the same for both 3174 scenarios.

21.4 3174 Definitions

Both 3174s have Configuration Support-C5 installed. Configuration Support-C5 requires patches (see Table 16 on page 421) for any CSCM requests that involve the use of a library member. If you access the library without having the patches installed, the commands will return the following SNA sense codes:

- 0879-0001
- 0879-0002

In this scenario we show the use of the dialog interface as well as the commands entered from the command line.

21.4.1 Prepare 3174 Establishment Network Controller

This section describes the customization steps that have to be executed at a 3174 controller equipped with configuration support C5. We show and describe the different configuration panels.

21.4.1.1 Prepare the Central Site 3174

Shown are the 3174 configuration panels to customize the central site 3174. For additional information about 3174 customization, see *3174 Establishment Controller Planning Guide*, GA27-3918, and *3174 Establishment Controller Installation Guide*, GG24-3061.

Defining the 3174 Attachments

```

_____ Model / Attach _____

Online Test Password    098 -

Product Assistance Data
099 - 31743 CENTRAL SITE CSCM  C5 SETUP

3174 Model              100 - 13R

Host Attachment         101 - 7    1-BSC           6-SDLC, X.21 Switched
                               2-SDLC           7-Token-Ring
                               3-X.25           8-Ethernet
                               4-Non-SNA Channel 9-Frame Relay
                               5-SNA Channel   M-Multi-host

LAN adapter type        102 - 1    0-none
                               1-Token-Ring
                               2-Ethernet

NSO selection           103 - 0000000000000000
Select Test; press ENTER ==>

PF:  3=Quit  8=Fwd 12=Test Menu
```

Figure 490. 3174 - Attachment Menu

In the LAN adapter type we specify 1 for the token-ring connected 3174 and press PF8 to get to the Token-Ring Description menu.

Token-Ring Description

```

_____ Token-Ring Description _____

Token-Ring Address    080 - 4000 3174 0003

Token-Ring Speed      082 - 0  (0- 4Mbps
                               1-16Mbps
                               2-16Mbps with early Token Release)

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd  12=Test Menu

```

Figure 491. 3174 - Token-Ring Description Menu

Specify the token-ring address and the token-ring speed of the LAN where the 3174 is connected.

Enabling APPN

```

_____ Common SNA _____

500 - 2          501 - USIBMRA_    502 - CP31743_

APPN Support Fields:

510 - 1          511 - CP31743_    512 - VC31743_

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd  12=Test Menu

```

Figure 492. 3174 - Common SNA Menu

To define the 3174 as an independent LU 6.2, specify the fields as described for the following common SNA menu:

- **500** = 2 indicates the CSCM is in use as a Central Site Control Unit.
- **501** = the network ID of the network where the 3174 belongs.
- **502** = the LU name of the 3174; it must be equal to the name used in 511.
- **510** = 1 indicates that we want APPN support; this is required to support independent LUs.
- **511** = the CP name of the 3174; it must be equal to the name used in 502.

See also Table 16 on page 421.

Table 15. Relationship between Q510, Q511 and Q502		
Answer to Question 510	CPNAME-LUNAME	LU 6.2 Type
1	Q502=Q511	Independent
1	Q502≠Q511	Dependant and Independent
0	Q502=Q511	Dependant
0	Q502≠Q511	Dependant

When Question 510=1 and Question 502≠Question 511, one dependent LU exists with the name specified in Question 502, and one independent LU exists with the name specified in Question 511.

21.4.1.2 Prepare the Network Site 3174

This section shows the configuration panels used to customize the 3174 network site controller.

Specify the token-ring address of the 3174 controller in the Token-Ring Description menu.

See the following for the token-ring address:

```

_____ Token-Ring Description _____

Token-Ring Address   080 - 4000 3174 0004
Token-Ring Speed     082 - 0  (0- 4 Mbps
                             1-16 Mbps
                             2-16 Mbps with early Token Release)

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu
```

Figure 493. 3174 - Token-Ring Description Menu

To define the 3174 as an independent LU 6.2, define the fields in the following common SNA menu:

```

_____ Common SNA _____

500 - 1          501 - USIBMRA_    502 - CP31744_

APPN Support Fields:

510 - 1          511 - CP31744_    512 - VC31743_

Select Test; press ENTER ==>

PF:  3=Quit  7=Back  8=Fwd 12=Test Menu

```

Figure 494. 3174 - Common SNA Menu

- **500** = 1 indicates the CSCM is in use as a Network Site Control Unit.
- **501** = the network ID of the network where the 3174 belongs to.
- **502** = the LU name of the 3174; it must be equal to the name used in 511.
- **510** = 1 indicates that we want APPN support; this is required to support independent LUs.
- **511** = the CP name of the 3174; it must be equal to the name used in 502.

For more information see Table 16 on page 421.

21.5 Activation and Verification

When the installation of NetView DM/2 and the customization of the NetView DM/2 and the 3174 controller is completed successfully, the distribution of microcode and microcode customization data can be managed by using the file service commands between the NetView DM/2 remote administrator workstation and the 3174 Establishment Network Controller.

All change management and file service commands are tracked in the remote administrator workstation catalog and can be viewed in the CDM Status Request window or with the LIST_REQ command. The remote administrator workstation receives reports from change management activities of the 3174 Establishment Network Controller.

The messages are logged in a file with the default name MESSAGE.DAT. The NetView DM/2 CDM Local Message Log window shows the date and time that a message was issued, the message ID and type, and the message text.

Error information is logged in a file with the default name ERROR.DAT. The NetView DM/2 CDM Local Error Log window shows the date and time that an error occurred, as well as the component and module that reported that error.

The file names for the message and error file can be configured in the IBMNVDM2.INI file.

21.5.1 Using 3174 CSCM

We have already built a customization data object and the utility microcode on the central site 3174. In the following example we:

- Retrieve the objects from the central site 3174 to the remote administrator
- Send the data to the network site 3174
- Install the object
- Activate the 3174 to make the changes effective

Let's Start.

1. On the remote administrator workstation, we retrieve the:

- New functional release of 3174 utility microcode (FUNCTEC)
- New customization data objects

When you start the NetView DM/2 Dialog application you will see the Catalog Window:

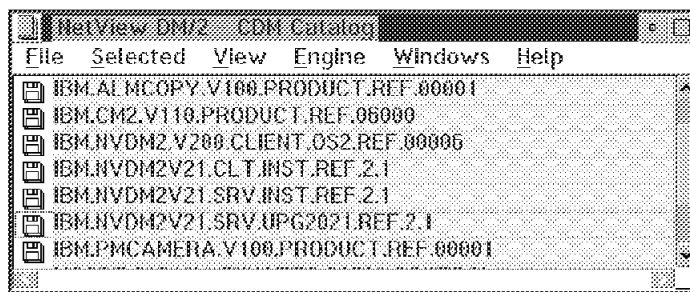


Figure 495. NetView DM/2 Catalog Window

To retrieve an object from a 3174 central site select **Selected**, and then **Retrieve** from the pull-down menu.

In the Retrieve window, select the global name of the object you want to retrieve and select the name of the 3174 central site. See Figure 496 on page 417 for an example of how to retrieve the new functional release of 3174 utility microcode using CDM dialogs.

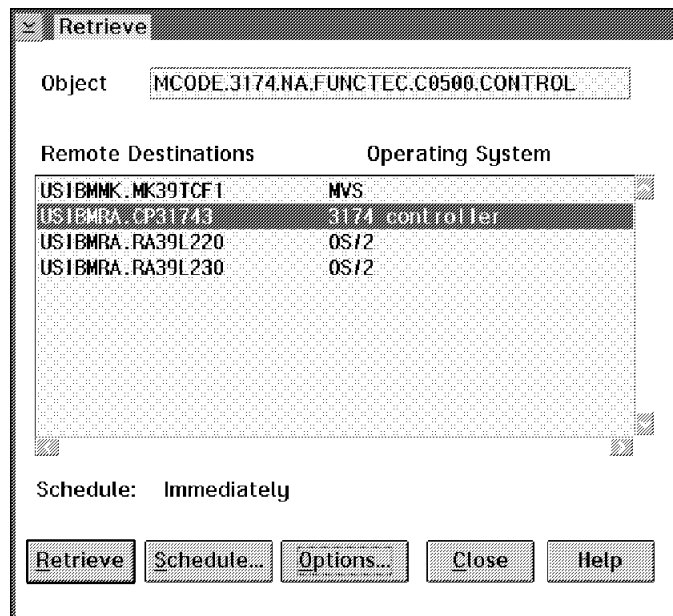


Figure 496. Retrieve the New Functional Release of 3174 Utility Microcode

Click on **Options...** to specify additional parameters, for example, if you want to replace an already existing object.

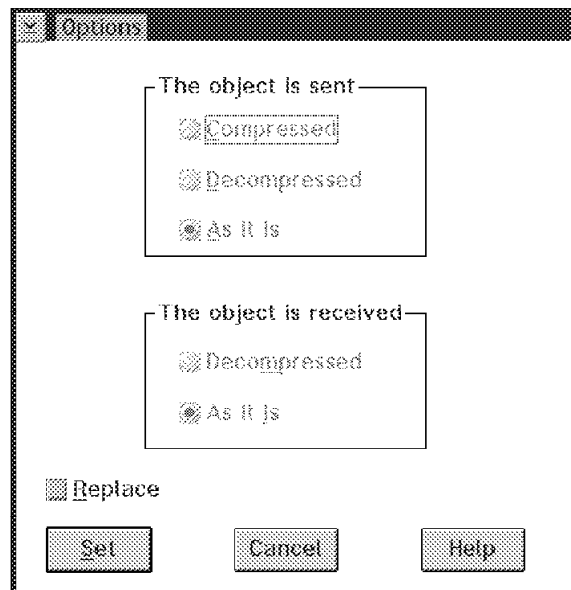


Figure 497. Retrieve Options Window

Note

Object compression is not supported by the 3174 Establishment Network Controller.

See the following example of how to retrieve the new functional release of 3174 utility microcode and new customization data objects using CDM commands:

```

CDM RETRIEVE  MCODE.3174.NA.FUNCTEC.C0500.CONTROL
               USIBMRA.CP31743

CDM RETRIEVE  MCUST.3174.NA.USIBMRA.CP31744.CFG.REM31744.000001
               USIBMRA.CP31743

```

When the RETRIEVE request has been executed successfully, the objects are stored in the catalog of the remote administrator workstation.

2. We send an object to a 3174 network site; therefore, mark the global name in the CDM Catalog window. Choose **Selected**, and then select **Send** from the pull-down menu and then the name of 3174 network site to which you want to send them.

See Figure 498 for an example of how to send the new functional release of 3174 utility microcode using CDM dialogs.

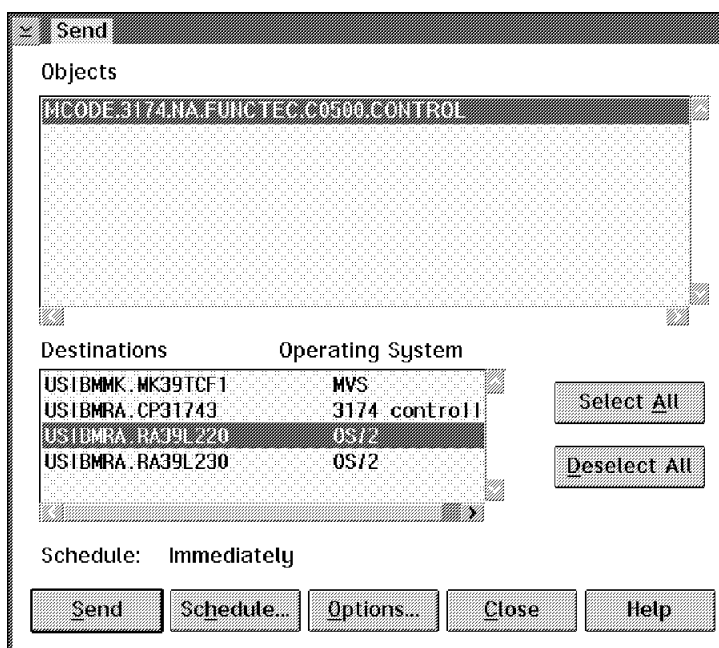


Figure 498. Send the New Functional Release of 3174 Utility Microcode

See the following example of how to send the new functional release of 3174 utility microcode and new customization data objects using CDM commands:

```

CDM SEND  MCODE.3174.NA.FUNCTEC.C0500.CONTROL
          USIBMRA.CP31744

CDM SEND  MCUST.3174.NA.USIBMRA.CP31744.CFG.REM31744.000001
          USIBMRA.CP31744

```

3. We now install the microcode at the network site 3174. Select the global name in the CDM Catalog window. Choose **Selected**, and then select **Install** from the pull-down menu and then the name of the 3174 network site to which you want to send them.

See Figure 499 for an example of how to install the new functional release of 3174 utility microcode using CDM dialogs.

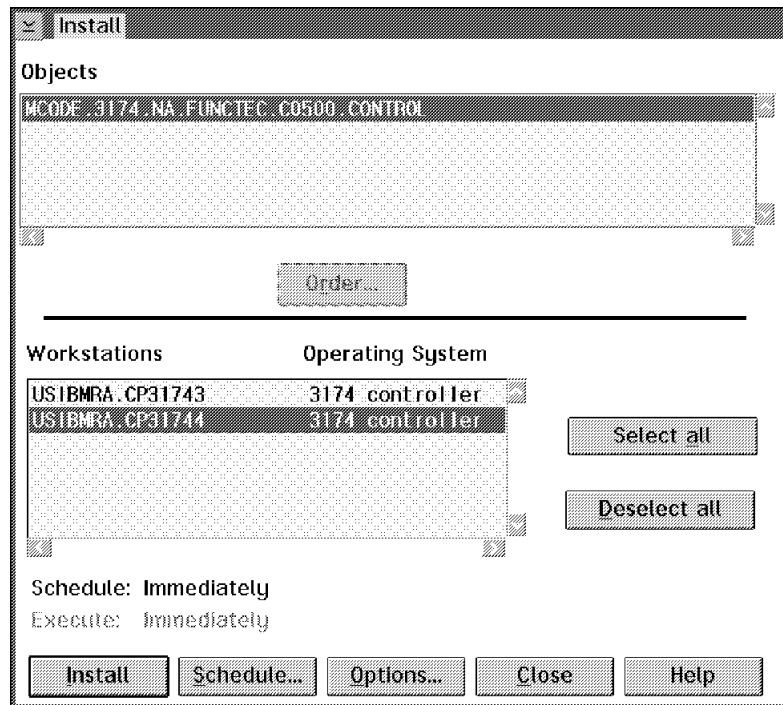


Figure 499. Install the New Functional Release of 3174 Utility Microcode

In the Install Option window, we specify *Removability NO*, which also means that we must install the object into the active area.

See the following example of how to install the new functional release of 3174 utility microcode and new customization data objects using CDM commands:

```

CDM INSTALL      MCODE.3174.NA.FUNCTEC.C0500.CONTROL
                  USIBMRA.CP31744 /DA:A /R:N

CDM INSTALL      MCUST.3174.NA.USIBMRA.CP31744.CFG.REM31744.000001
                  USIBMRA.CP31744 /DA:A /R:N

```

To see the installation history of the 3174 network site, open the CC domain window of the remote destination CP31744. Select **Open** from the Selected pull-down menu and **Objects** in the Open Workstation window. The following window appears:

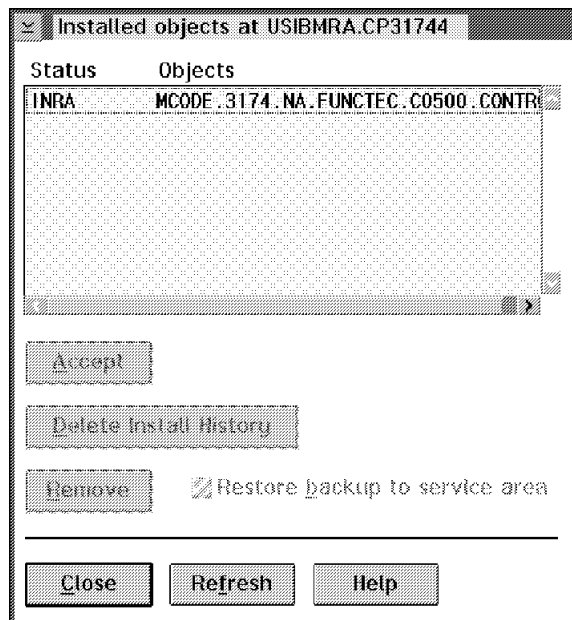


Figure 500. The Installed Objects Window

The status *INRA* means that the functional update for the 3174 is *installed, non-removable, and activation is required*.

4. We IML the 3174 to make the new configuration active. Therefore we mark the node in the CC Domain of USIBMRA.CP31744 window and select **Activate** from the Selected pull-down menu:

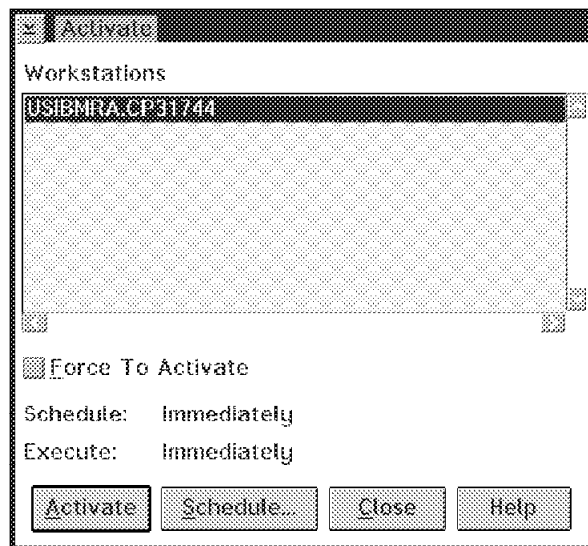


Figure 501. Activate Window

After the IML the object has the status *INRU* which represents *installed, non-removable, and in use*.

21.6 Prerequisites

The following table shows the different microcode configuration support levels, which type of LU 6.2 they support, and which patches are needed to communicate with NetView DM/2:

<i>Table 16. Microcode Support Level, Supported LU 6.2 Types and Needed Patches</i>		
Microcode Level	LU 6.2 Type	Patches needed
C-1	Independent	PCAD104 PCAEB61 PCA9B03 PCA9B04 ZCAF0E1 ZCAF0E2
C-2	Independent	PCAD101 PCAEB62 PCA9B01 PCA9B02 ZCACA81 ZCACA82
C-3	Independent	PCAEB63 PCAD103 ZCACA87 ZCACA88
C-4	Independent	PCAEB65 PCAD105 ZCADB91 ZCADB92
C-5	Independent	ZUB0231 ZUB03E1 ZUB03E2 ZUB03E3 ZUB0401 ZUB05A1 ZUB05C1 ZUB05C2 ZUB05C3 ZUB05D1 ZCB05D2

Appendix A. 3174 APPN Newest Enhancements

IBM extends the functional capabilities of the 3174 Establishment Controller with Configuration Support-C6 Licensed Internal Code (LIC) that enhances support for APPN, TCP/IP, and the Frame Relay Communications feature.

Configuration Support-C6 includes all functions of Configuration Support-C5 and many new and improved functional enhancements:

- Frame Relay Communications feature

The Frame Relay Communications feature is extended to provide source-route remote bridging. It expands your networking opportunities by interconnecting token-ring local area networks (LANs) across a wide area network (WAN) with speeds up to 256 kilobits per second. Multiport bridging expands the 3174 bridging function to allow source-routed traffic access to any combination of three ports: token-ring, frame relay, or Peer Communication (coax attachment). Remote source-route bridging uses frame relay to enable the 3174 bridge to attach token-ring and peer segments to remote token-ring and peer segments.

- APPN

The 3174 with APPN provides networking solutions for the present and the future. We continue to enhance the network node support by providing APPN support for ESCON channel connections. With the ESCON Director, the 3174 can have T2.1 link capability for up to eight host connections, improving the connectivity to S/390 and POWERparallel processors. Safe storage of the topology database to hard disk is provided in Configuration Support-C Release 6.

- TCP/IP

The IP Forwarder provides static routing between a LAN and a frame relay network for TCP/IP devices. IP forwarding allows devices on the LAN and the frame relay network to send IP datagrams to the 3174 with an IP destination address other than the 3174's IP address. The 3174 performs basic IP routing, using customized, static routes to forward the datagram as appropriate.

TCP/IP is enhanced to include the TN3270 protocol and MIB-II variables for SNMP, and to support printers using the Line Printer Daemon (LPD) server.

- Record/Play

The Record/Play function allows CUT and ASCII devices attached to a 3174 to store and play back keystroke sequences with a single keystroke. Up to 24 separate keystroke sequences can be stored, played on any CUT or ASCII device, and distributed to other 3174s via central site distribution.

- Extended language support

The ASCII Emulation Adapter language support includes nine additional Eastern European languages.

With Configuration Support-C6's announcement, the 3174 continues its evolution as a multiprotocol networking server. Customers can preserve their investment and expand to the new LAN/WAN communications.

Today's networking environment is changing from hierarchical to multiprotocol client/server. The 3174 Establishment Controller has evolved to address both traditional host-centric networks with mainframe connectivity and network-centric configurations based on LANs.

A.1.1.1 Network Solutions

The sales representative should present the 3174 as providing networking solutions. Network managers are faced with the problem of needing to integrate new technologies such as LAN protocols and client/server distributed applications and at the same time better utilize their existing equipment.

The solution for SNA is APPN networking, using the 3174 as a network node (NN) server with the Dependent LU Requester function. With the addition of APPN for ESCON connections, the 3174 network node provides services and connectivity for APPC applications in S/390 systems and POWERparallel processors. Now Low Entry Nodes (LENs) and end nodes (ENs) on the LAN can be routed by the 3174 NN to eight hosts that are connected via the ESCON Director. Customers that are currently using the LAN Gateway for DSPUs (downstream PU2.0) can realize the potential benefits of moving to APPN for their users attached on the LAN (token-ring or Ethernet). APPN overcomes the deficiencies of LAN gateways by eliminating the use of one subchannel per DSPU and the static definition of mapping a LAN address to a host address.

For protocols such as IPX and NetBIOS, and other protocols that can be bridged, the 3174 source-route remote bridges provide interconnection for token-ring users across a frame relay network.

For TCP/IP, the IP Forwarder function, provides routing with static route definition for token-ring or Ethernet LAN users.

The 3174 is uniquely positioned to provide all of these functions and more, simultaneously: APPN, bridging, IP, LAN Gateway, SNA, etc.

A.1.1.2 Customers Migrating to APPN

Sales representatives should convey to their 3174 customers that the 3174 network node (NN) can coexist with all other functions in the 3174. The 3174 NN provides *shared-link* support for PU2.0 and T2.1 data. The T2.1 ESCON link transports all the APPC traffic from the APPN network to the S/390 or POWERparallel processor and the PU2.0 traffic from the locally attached devices on the 3174.

Similar to current APPN support, the 3174 ESCON models with LAN Gateway and NN features offer a migration path for workstations on the LAN that are adding new APPC applications. The workstation can dynamically determine the link type: PU2.0 only, shared link of PU2.0/T2.1, or T2.1 only, at link establishment time. The EN on the LAN can dynamically change modes just by re-establishing the link and with no definition at the 3174 NN.

Dependent LU Requester (DLUR) allows the 3270 dependent displays and printers locally attached to the 3174 to receive the benefits of APPN. In addition to the eight possible ESCON host attachments, DLUR allows the dependent LUs of an ESCON-attached 3174 to be routed to any VTAM host in the APPN network. With APPN and DLUR, multiple hosts, multiple logical terminals, and multiple LU definitions are no longer required.

A.1.1.3 Customers Migrating to Frame Relay

With the addition of the Frame Relay Communications feature and Configuration Support-C6, the 3174 can expand your networking opportunities for interconnecting LANs at speeds up to 256 Kbps. Frame relay is a perfect match for the new LAN internetworking. With the 3174's source-route remote bridge function, users can interconnect token-ring LANs for workstations using multiple protocols. Frame relay is simple, reduces cost of data networking, and provides improved performance.

The remote bridging function coexists with other functions such as APPN, IP, and LAN Gateway in a frame relay network. With only a microcode upgrade to the Frame Relay Communications feature, your existing 3174 at Configuration Support-C6 can provide source-route remote bridging. Customers can solve their connectivity problems while at the same time preserving their investment in applications and hardware. The 3174 can be positioned in networks as a feeder node where branch offices with many local needs must reach applications or hosts at remote locations.

The widespread availability of frame relay makes it an attractive interface that is expected to boom over the next several years.

A.1.1.4 TCP/IP Solutions

This release expands the multiprotocol capabilities of the 3174 and makes the 3174 solution a better choice for customers that have TCP/IP as a protocol in their network.

IBM representatives should point out that the IP forwarding capabilities of the 3174 allow the 3174 to be used in place of routers in certain configurations. This could reduce the expense of the network by eliminating the need for multiple pieces of equipment and the cost of multiple communication links. The 3174 can forward IP datagrams to destination subnets that have been defined in the 3174. For those destinations not defined, the 3174 can forward the IP datagrams to a central router.

The 3174 can assist the customer by providing TN3270 support for IP networks. Customers can now access 3270 applications using TCP/IP as the transport. The 3270 data stream is passed over TCP/IP instead of using the SNA transport network.

IBM representatives should point out that the 3174 can now be used by TCP/IP hosts to send printer output to 3174-attached printers. The 3174 can accept printer output for either coax or ASCII printers that are attached to the 3174.

IBM representatives should convey to TCP/IP customers that are using SNMP that they now have the capability to use the MIB-II variables from RFC 1213, token-ring MIB variables from RFC 1231, and Ethernet MIB variables from RFC 1398. This capability expands the current 3174 support, which is MIB-I.

A.1.1.5 Record and Play

The IBM representative should contact customers that have repetitive data entry operations on CUT or ASCII devices. The Record/Play function can improve operator productivity by reducing the amount of keystrokes required. Additionally, the reduction of keystrokes further increases operator productivity by reducing operator entry errors.

Configuration Support-C6 LIC features are available at no additional charge to customers that have licensed an earlier release of Configuration Support-C Licensed Internal Code. APPN, Peer Communications and AEA feature code now ship as part of the Configuration Support-C Licensed Internal Code. The remote source route and multiport bridging update is available at no additional charge to customers that have licensed the Frame Relay Communications feature.

Configuration Support-C customers are notified by mail when Configuration Support-C Release 6 is available. Customers that have licensed the Frame Relay Communications feature are notified by mail when remote source-route and multiport bridging update to the Frame Relay Communications feature is available.

The Configuration Support-C and related features are as follows:

Configuration Support-C LIC	F/C 6010 or F/C 6015 or F/C 6060 or F/C 6065
Frame Relay Communications	F/C 7020 or F/C 7070

Refer to the 3174 Sales Manual pages for details on these features.

Configuration Support-C6 includes all functions of CS-C Release 5 and enhances the support for the Frame Relay Communications feature, APPN, and TCP/IP.

- Frame Relay Communications feature enhancements include:
 - Multiport bridging that connects two or more bridge ports with a combination of token-ring, frame relay, or Peer Communication support
 - Remote source-route bridging that uses frame relay to enable the 3174 bridge to attach token-ring and Peer segments to remote token-ring and Peer segments
- APPN enhancements include:
 - Support for up to eight ESCON channel connections
 - Safe storage of the APPN topology database if a hardfile is available
- TCP/IP enhancements include:
 - IP forwarding of datagrams through the 3174
 - TN3270 support to provide access to 3270 applications using TCP/IP as the transport
 - Printer support to allow TCP/IP hosts to send print output to 3174-attached printers
 - An SNMP extension to support MIB-II variables for RFCs 1213, 1231, and 1398
- Other enhancements include:
 - Recording of up to 24 separate keystroke sequences and playback on any attached CUT and ASCII terminals
 - ASCII Emulation Adapter (AEA) support for nine additional Eastern European languages for AEA terminals

A.1.2 Remote Source-Route Bridging (in Features 7020 and 7070)

The 3174 Frame Relay Communications feature, along with other IBM products, supports RFC 1490 (updated RFC 1294), a multiprotocol standard for frame relay. This standard establishes a format for transport across a frame relay network, so that any other device that meets this standard can read all traffic sent into the network. Therefore, the 3174 can support multiple protocols, including bridge traffic, across the frame relay network.

Remote bridging requires a frame relay connection between two compatible bridges which are partners. The 3174 bridge can interoperate with other frame relay remote bridge partners such as 6611, RXR/2, 3172, or another 3174 for bridging token-ring LANs. For complete connectivity via bridging, the bridge partners should be fully meshed in the frame relay network.

The 3174 uses a single ring number for the entire frame relay network and learns of other ring numbers by observing the Routing Information field of received frames. When you use the same ring number for the frame relay network among all of the bridges (3174s, RXR/2) connected to the frame relay network, the route between bridge partners is seen as one hop. If the two partners use different ring numbers (such as 6611), the frame relay network will be seen as two hops.

The current 3174 bridge support with the Peer Communications support is a two-port bridge connecting a token-ring segment to a Peer (coax-attached) segment. With the addition of frame relay, the bridge is expanded to support multiple physical connections of Peer (coax), token-ring, and frame relay. Multiport bridging allows source-routed traffic to access any combination of three bridge ports, simultaneously.

To reduce network traffic and congestion, administrators can selectively filter traffic forwarded by the 3174 bridging function. By selecting a number of filters, the customer has a way to support network isolation. These filters are defined on a port basis during customization and allow filtering of received or transmitted frames based on the following conditions:

- MAC address
- Source SAP
- SNAP Ethertype value
- Route designator (segment and bridge number)
- Hop count
- Frame data and offset (user-definable)

3174 bridging provides LAN Network Manager (LNM) interfaces for the management of the 3174 multiport bridge and the 3174-Peer LAN segment. This enables users to migrate their network to include LAN/WAN distributed networking without disruption to their network management.

Remote bridging can be viewed as the right business solution for allowing LAN-based applications to be accessed by any protocol when users have the need for them. Frame relay with remote bridging provides growth enablement as users can access more applications by accessing different points over a single access port. Remote sites can gain access to other token-ring LANs across a meshed network with a single link.

A.1.3 APPN Enhancements

APPN over ESCON provides T2.1 link connectivity that allows the 3174 network node to route LU sessions from devices on a LAN to S/390 hosts and POWERparallel processors. The 3174 supports attachment to a LEN Subarea node in VTAM V3R4 or an end node or network node in VTAM V4R1 or later.

The 3174 APPN support is required to route APPC application programs running in workstations on the LAN and to support the ESCON Manager program that utilizes LU6.2 sessions. With the Dependent LU Requester (DLUR) support in the 3174 ESCON model, the customer can benefit from ease of definition and APPN routing for devices locally attached to the 3174. This function reduces the complexity of system definition.

The 3174 attached to an ESCON director can access up to eight different hosts or eight parallel processors. This multihost capability of ESCON can hold down the cost and eliminate the need for parallel channel support.

The 3174 APPN function, in conjunction with the LAN gateway function, provides *shared link* support that enables both T2.1 data from the LAN devices and dependent LU data from the 3174 to share the same channel connection to the host.

With this support, customers can continue to use their investment in 3174s, wiring, and applications, while they upgrade to the new technologies of APPC and APPN.

A.1.4 TCP/IP Enhancements

Configuration Support-C6 extends and enhances the support of TCP/IP on the 3174.

A.1.4.1 IP Forwarder

IP Forwarder provides static routing between a LAN interface (token-ring or Ethernet) and a frame relay interface. Static routes are used to forward IP datagrams through the 3174. IP forwarding allows devices on the LAN and the frame relay to send IP datagrams to the 3174 with an IP destination address other than the 3174's IP address. The 3174 performs basic IP routing using customized, static routes to forward the datagrams. Now 3174s at remote LANs can be connected to each other or other IP routers by a frame relay network and route IP traffic to interconnect IP devices on a LAN.

The function was previously provided for Configuration Support-C only via RPO 8Q1289.

A.1.4.2 IP Enhancements

TN3270 enables terminals attached to the 3174 to access 3270 applications using TCP/IP as the transport mechanism. The 3270 data stream is passed over TCP/IP just as it is passed over an SNA transport network. This allows terminals on the 3174 to access TCP/IP for VM or MVS for full-screen applications, and CICS/6000 3270 applications.

Line Printer Daemon (LPD) server support allows TCP/IP hosts to send printer output to 3174-attached printers. With the LPD server, the 3174 is able to accept print jobs for either coax or ASCII printers that are attached to the 3174.

Extensions have been made to the SNMP support to provide the MIB-II variables from RFC 1213, the token-ring MIB variables from RFC 1231 and the Ethernet MIB variables from RFC 1398.

The function was previously provided for Configuration Support-C only via RPQ 8Q1041.

A.1.5 Record/Play

The Record/Play function allows the 3174 to store and play keystrokes with a single keystroke. A keystroke sequence can be recorded by any CUT or ASCII terminal and then played back by all other attached CUT or ASCII terminals. Up to 24 separate sequences can be stored in the 3174. A keystroke sequence has a maximum of 950 keystrokes with an aggregate total of 6000 keystrokes for all 24 sequences.

The Record/Play function eliminates repetitive keystroke operations by the operator. Instead of typing the same sequences, the user can store the keystrokes and retrieve the sequence anytime when the play sequence is entered. This function improves operator productivity by eliminating the entry of multiple keystrokes and operator typing errors.

A.1.6 Extended Language Support

The 3174 has extended the AEA language support to include nine additional Eastern European languages:

- Croatian/Serbian/Slovenian
- Czech
- Hungarian
- Polish
- Romanian
- Slovak
- Cyrillic Bulgarian
- Cyrillic Russian
- Cyrillic Macedonian/Serbian

The function was previously provided for Configuration Support-C only via RPQ 8Q1294.

A.1.7 Open Enterprise

- APPN feature

Using 3174 APPN support, the IBM 3174 performs the role of an SNA T2.1/LU6.2 NN server providing the distribution of applications and peer-to-peer communications across the SNA network.

- Frame Relay Communications feature

Source-route remote bridging supports token-ring-based protocols for source-route bridging and LNM.

- TCP/IP

The 3174 can participate in TCP/IP router networks by forwarding IP datagrams through the 3174 via predefined, static routes.

The 3174 support of MIB-II extends the 3174 conformance to standard RFCs for token-ring and Ethernet.

A.2 Product Positioning

The 3174 Frame Relay Communications feature with remote bridging has significant interoperability with compatible IBM and original equipment manufacturer (OEM) products. The 3174 source-route remote bridge is compatible with IBM products such as the RXR/2, 6611, and 3172 that support source-route bridge standards and frame relay RFC 1490 and 1294.

The 3174 is the only controller that is a network node server and router for APPN nodes attached via ESCON channel.

The 3174 TCP/IP functional enhancements for this release extend the 3174 multiprotocol capabilities. IP forwarding allows the 3174 to be positioned as a limited-function router in specific configurations. With TN3270 and printer LPD support, the 3174 permits the customer to more fully utilize both SNA and TCP/IP networks.

The Record/Play function again positions the 3174 as a product that can improve the productivity of the data entry operator by reducing the time required to enter data and reducing operator typing errors.

Limitations: Some limitations of Configuration Support-C are as follows:

- The 3174 DLUR function does not support dependent LUs attached to downstream PU2.0 nodes.
- In order to receive dependent LU accounting provided by NCP/NPM, the session data must pass through an NCP.
- The APPN LIC feature does not support communication through the Concurrent Communications Adapter (CCA) or ISDN BRI Adapter.
- The 3174 source-route remote bridge does not support automatic mode of the Spanning Tree algorithm. Manual mode is supported.
 - The Spanning Tree limitation is addressed by the Statement of Direction of 2/1/94.
- The 3174 source-route remote bridge is not supported on the Ethernet models (for example, 14R, 64R, 24R) or 3174s with the Ethernet adapter.
- LNM support in the 3174 bridge does not provide a frame relay reporting link. Therefore, for LNM support, a token-ring is required and a LAN Network Manager (for example, LNM for OS/2) is needed for each token-ring network.
- Frame relay is not supported via communication through the Concurrent Communications Adapter (CCA) or ISDN BRI Adapter.
- IP forwarding does not support IP routing protocols used between routers to dynamically update routing tables.
- TCP/IP printer support is not provided for printers that are attached to displays (host-addressable printers).

Appendix B. APPN Overview

This appendix is a basic overview of the benefits, concepts, and terminology of an APPN network. If the reader has considerable knowledge of APPN, this appendix serves strictly as a reference and thus can be skipped.

The purpose of this topic is to give a brief overview of advanced peer-to-peer networking (APPN), what it is, and what benefits can be achieved from it. If more detailed information is desired, there are many excellent documents available through the International Technical Support Organization (ITSO). One of them is the *APPN Architecture and Product Implementations Tutorial*, GG24-3669.

B.1 What Is APPN?

APPN is an enhancement to IBM's systems network architecture (SNA). It allows interconnection of systems of widely different sizes into networks of a dynamic topology. The resulting network is easier to use, more reliable, and more flexible.

The original T2.1 architecture allows peer-to-peer connection of *low entry networking end nodes* (LEN end nodes or just LEN nodes) connected end-to-end, and is mainly intended to support communications between logical units type 6.2 (LU 6.2). Dependent LU protocols are supported from T2.1 nodes only to boundary nodes, using T2.0 protocols, but not to other directly attached T2.1 nodes. A T2.1 node supports independent LU protocols to other directly attached T2.1 nodes as well as to a boundary node. T2.1 nodes use protocols with reduced system customization requirements. For example, independent LU protocols do not require pre-assigned session addresses, and link station roles can be negotiated using XID3 exchanges.

APPN extends T2.1 node support to provide enhanced connectivity across an APPN network via:

- Intermediate node routing
- Enhanced directory functions
- Dynamic update of network topology, routes and directories

APPN also introduces two new node types:

- APPN end node
- APPN network node

A *LEN node* has a true peer-to-peer relation with another APPN node connected to it. From the architecture viewpoint, there are only *two* adjacent nodes involved in an LEN connection. That is, no matter how many nodes are actually in the network, the LEN connection is only between two nodes. Multiple links (transmission groups) are supported, but not parallel links.

An *APPN end node* extends the LEN end node by implementing functions that allow the end node to participate more fully in an APPN network. An end node does the following:

- Allows itself to be searched for session setup, so that predefined routes are not required in other nodes
- Is able to support parallel links to other APPN nodes in an APPN network

And as the name implies, it is at the end of a route.

An *APPN network node* provides function beyond that of the APPN end node. A network node is able to:

- Participate in network-wide distributed directory searches for LUs, cache search results, and directly verify the continued availability of the LUs to the network.
- Broadcast a network topology database update to other network nodes whenever there is congestion. In this way, every network node in the network has an updated copy of the network topology database containing information on all active network nodes and links between them.
- Dynamically compute session routes through an APPN network, based on the current topology information, the location of the session partners, and the requested *class of service*. A class of service (COS) specifies the relative significance of factors such as acceptable levels of security, cost per byte, cost per connect time, propagation delay, and effective capacity when selecting the best route for a session.
- Support intermediate session routing. This includes the activation/deactivation of session routes through an APPN network, as well as the hop-to-hop pacing and segmenting of session traffic.
- Provide management services support. This includes the ability to be defined as a management services focal point for network problem management.
- Act as a *network node server* to end nodes. An end node has to select one of its adjacent network nodes as its network node server. A network node helps the end nodes it serves to locate resources in the network they are looking for and assists in setting up the LU-LU session(s). It also helps to register resources of its served end nodes, as requested by the end nodes. Locating a resource that has been registered requires less time. A network node server can act as an intermediate routing node to its served end nodes when there is outgoing or incoming session data to and from other nodes in the network, but the session path does not have to cross necessarily through the network node server.

There is a *control point* (CP) in each end node, or network node (also in LEN nodes, in a limited role). The role of the CP in the APPN network is similar to that of the SSCP in the subarea network. It is responsible for managing the T2.1 node and its resources. It activates links to adjacent T2.1 nodes, establishes CP-CP sessions with adjacent nodes, and interacts with the node operator through the node operator facility. For its local LUs, the CP assists in finding the partner location and provides routing information. APPN networks can consist of any number of nodes. Different types of connections may be used, as for example SDLC (leased or switched), token-ring, and X.25. Within an APPN network, automatic network topology and directory support are provided to simplify network definitions and permit dynamic route selection.

B.2 APPN and APPC

The APPN architecture was designed to work very closely with IBM's logical unit 6.2 (also known as advanced program-to-program communications, or APPC). APPC provides a standard set of functions required for all kinds of connectivity requirements, including program-to-program, program-to-device, and device-to-device communication. APPN uses and enables APPC.

APPN's system of network control and configuration uses LU 6.2 sessions to exchange messages and network information between nodes; APPN enables APPC because APPN protocols accommodate more fully the notion of communication between peer devices from which APPC is derived—particularly in their application to distributed processing environments, such as token-rings.

B.3 APPN Benefits

The purpose of APPN networking is to provide a network that is easy to use, has decentralized network control but centralized network management, allows for arbitrary topologies, and has connection flexibility and continuous operation.

The main characteristic of an APPN network is that there is no hierarchy. All nodes are independent and communicate with each other on a peer-to-peer basis. APPN networks support the requirement for any-to-any communication with dynamic adjustment to the topology of the network. All changes (for example, the addition of a new node) are made available to all other nodes in the network with minimum intervention.

APPN can therefore establish highly dynamic networks where nodes can join and leave as needed and session routes can be determined according to the current state of the network.

APPN is an enhancement to SNA and T2.1 node architecture that allows peer systems to interconnect and participate in a dynamic network that:

- Is easy to use
- Allows decentralized network control and centralized network management
- Allows dynamic network topology
- Allows connection flexibility
- Provides reliable operation
- Requires no specialized communication hardware
- Consider all links and nodes for efficient routing

APPN minimizes the need for system definition. Network resources, such as LUs and links, are defined only at the node where they are owned. APPN distributes this information through the network dynamically as needed. For example, if a node owning a specific session partner is connected to an APPN network, a distributed directory search can locate that resource.

Within APPN, there is no single point of failure. The network's topology is propagated throughout the network. APPN nodes can compute both parallel and disjointed routes through the network. They can distribute traffic load and minimize the effects of link failures by computing routes around the failed links.

DLUR/S extends the APPN routing to PU 2.0 nodes, thus protecting the investment in dependent displays and workstations.

APPN networks are also able to adjust data flow and message sizes without system programmer intervention.

APPN supports the following to simplify network definition and permit dynamic routing selection:

Distributed Directory Searches

Determines through network searches (among network nodes) the current node location of any remote logical unit (LU). This minimizes the need to define routing or location information for remote LUs with which a local LU owned by a node may establish a session.

Topology and Route Selection Services

Using the node and link characteristics maintained in its network topology database and the COS required, the network node server calculates the best route for communication to a route LU for resources that it serves. For more information about COS, see B.6, "Class of Service" on page 438.

Adaptive Pacing and Transmission Priority

Adjusts the session traffic flow and allows more important traffic to bypass less important traffic. When a session is established, a transmission priority is assigned to message units that will flow on the session and buffers are allocated based on COS and the existing network's capabilities.

Intermediate Session Routing

Allows session traffic to be routed through a network node for sessions that neither originate nor end at that node.

B.4 APPN Terminology

The following terms are used in discussions of APPN:

Adjacent Node

An adjacent node is a node that is either directly attached, or logically attached using a connection network.

APPN End Node (EN)

Referred to simply as an end node. It is a Type 2.1 (T2.1) node that supports sessions between its own control point (CP) and the CP in an adjacent network node to dynamically register its resources with the adjacent CP, to send and receive directory search requests, and to obtain network services and management services.

APPN Network Node (NN)

Referred to simply as a network node. It is a T2.1 node that in addition to offering full SNA end-user services also provides intermediate routing services within a T2.1 network, and network services to its local LUs and attached-T2.1 end nodes in its domain.

It can also attach to a subarea network as a peripheral node.

Class of Service (COS)

A designation of the transport network characteristics, such as route, security, transmission priority, and bandwidth. The class of service is derived from a mode name specified by the initiator of a session.

Connection Network

A representation within an APPN network of a shared-access transport facility, such as a token-ring network that reduces the system-customization burden of each APPN node attached to the facility. Each such node may represent its connectivity to the other, real nodes on the facility by a single, virtual routing node which each reports to its network node server in the APPN network.

Control point (CP)

A component of a node that manages resources of that node and optionally provides services to other nodes in the network.

The control point is responsible for managing the T2.1 node and its resources. It activates links to adjacent T2.1 nodes, exchanges CP capabilities when establishing CP-CP sessions with adjacent nodes, assists in locating partner LUs, and provides routing information.

CP-CP Sessions

The parallel sessions between two control points, using LU 6.2 protocols and a mode name of CPSVCMG, on which network services requests and replies are exchanged. Each CP of a given pair of CPs has one contention-winner session and one contention-loser session with the other.

Dependent LU Requester

This function is the client side of the *Dependent LU Server* function in which SSCP-PU and SSCP-LU flows to a PU T2.0 or APPN node attached to the requester are encapsulated within LU 6.2 sessions. The requester function provides a remote boundary function for dependent LUs.

Dependent LU Server

A function of a T5 or Interchange Node that provides server support for dependent clients in which SSCP-PU and SSCP-LU flows to a PU T2.0, APPN, or LEN node attached to the requester, or a PU T2.0, APPN, or LEN node image within the requester are encapsulated with LU 6.2 sessions.

Interchange Node (ICN)

A VTAM APPN node that is simultaneously a member of a subarea and an APPN network. The interchange node appears to the subarea as a host and to the APPN network as a network node. It is sometimes called a *Composite Node* if it is the owner of an NCP.

Intermediate Network Node

An intermediate network node is one that is *in between* at least two other nodes in a network. Some intermediate nodes in an APPN network are capable of performing intermediate session routing; these nodes are called network nodes.

Logical Unit (LU)

In SNA, a port through which an end user accesses the SNA network in order to communicate with another end user and through which the end user accesses the functions provided by system services control points (SSCPs). An LU can support at least two sessions, one with an SSCP and one with another LU, and may be capable of supporting many sessions with other logical units.

Low Entry Networking (LEN) End Node

Referred to simply as a LEN node. A Type 2.1 (T2.1) end node that provides SNA end-user services, attaches directly to other T2.1 nodes using peer protocols, and derives network services implicitly from an adjacent network node when attached to an APPN network without a session between its local CP and another CP; it can also attach to a subarea network as a peripheral node.

Migration Data Host (MDH)

A VTAM APPN node that is simultaneously a member of a subarea and an APPN network. The migration data host appears to the subarea as a host and to the APPN network as an end node.

Mode Name

The name used by the initiator of a session to designate the characteristics desired for the session, such as traffic pacing values, message-length limits, sync point and cryptography options, and the class of service within the transport network.

Multiple Link Support (Multitail)

The ability to have multiple, simultaneous connections between an APPN network and a subarea.

Node

Any device attached to a network that transmits and/or receives data. This is an end point of a link, or a junction common to two or more links in a network. In a network, this is a point where one or more functional units interconnect transmission lines.

Peripheral Node

A peripheral node is either a Type 2.0 (T2.0) or Type 2.1 (T2.1). Peripheral nodes are typically devices such as distributed processors, establishment controllers (such as the 3174), or workstations.

A T2.0 node requires the assistance of a system service control point node in order to communicate with another node.

A T2.1 node differs from a T2.0 node primarily by its ability to communicate directly with another type T2.1 node without the assistance of another node.

System Services Control Point (SSCP)

In SNA, the focal point within a subarea network for managing the configuration, coordinating network operator and problem determination requests, and providing directory support and other session services for end users of the network. Multiple SSCPs, cooperating as peers, can divide the network into domains of control, with each SSCP having a hierarchical control relationship to the physical units (PUs) and logical units (LUs) within its domain.

SSCP Takeover

SSCP takeover allows one SSCP to assume ownership of NCP boundary function connections previously owned by the same or another SSCP without breaking the connections or disrupting existing LU-LU sessions on the connections.

T2.1 Node

A T2.1 node provides support to allow it to participate in a peer-to-peer network. Type 2.1 support (T2.1 without APPN) is also called low entry networking. T2.1 was referred to in SNA as PU 2.1.

Types of T2.1 nodes are:

- Network node (NN)
- End node (EN)
- Low entry networking (LEN) end nodes

Topology Database

The representation of the current topology of the intermediate routing portion of the APPN network. The network topology database contains entries for network nodes and the transmission groups (TGs) interconnecting them. Each entry describes the current characteristics of the node or TG that it represents.

Transmission Group (TG)

A group of links between adjacent subarea nodes appearing as a single logical link for routing of messages. A transmission group may consist of one or more SDLC links (parallel links) or of a single System/370 channel. In APPN, the transmission group is synonymous with the link.

Virtual Routing Node

A representation of an end node's connectivity to a connection network defined on a shared access transport facility, such as a token-ring network.

B.5 Names in SNA Networks

In all SNA networks, names identify both network resources and the networks themselves. Names fall into three categories:

- Network identifiers
- Network names
- Network-qualified names

B.5.1 Network Identifiers

A network identifier (network ID) is an eight-character alphanumeric name that uniquely identifies a network. Within an APPN network, all network nodes share a common network ID. A unique network ID is assigned during APPN customization in your response to 501: Network ID (NETID).

B.5.2 Network Names

A network name is an eight-character alphanumeric symbolic resource identifier. Each network resource, such as control point and logical unit, in an SNA network can have a network name. Network names eliminate the need for application programs, network operators, and workstation operators to know the locations of different resources within the network.

B.5.3 Network-Qualified Names

A network-qualified name identifies both a resource and the network in which the resource is located. It is a concatenation of the network ID and the network name of the resource.

A control point name is a network-qualified name of a control point, consisting of a network ID qualifier identifying the network (for name space) to which the CP's node belongs, and a unique name within the scope of that network ID identifying the CP. Each T2.1 node has one CP name assigned to it during system definition. Assigning network control point names is done during 3174 customizing in your response to 511: APPN control point name (CPNAME). For example, a network ID of USA and a control point (CP) name of RALEIGH would be concatenated to become USA.RALEIGH. The period (.) along with the two names is what is referred to as concatenation. Your responses to Questions 501 and 511 are used in determining this name. BIND requests for LU 6.2 sessions specify network-qualified names.

B.6 Class of Service

Class of service (COS) is a means of expressing the characteristics of links (for example, priority levels of high, medium, or low) assigned to the transmission groups (TGs) and the intermediate routing nodes required for routes in advanced peer-to-peer networking (APPN) when sessions are established.

Network nodes maintain information (in the topology database) about all network nodes and the links between network nodes. When a session is requested, a mode name is specified. Each mode name contains a parameter (class of service) that specifies the class of service description that will be used to calculate the route the session will take.

The ability to specify a mode name and COS table at session establishment time provides an increased amount of flexibility in terms of session characteristics and route selection. However, in many cases, such flexibility may not be required. Therefore, IBM provides seven predefined mode names and corresponding COS tables.

The COS also specifies the transmission priority that will govern the rate of data transfer after the session has been established.

A class of service of two parts: TG (link) characteristics and node characteristics.

- For links, the COS description is compared to the set of characteristics that are specified in B.7, "Specifying COS Characteristics" on page 440.
- For nodes, the COS description is compared to the route addition resistance (RAR) specified in B.7.4, "Node Characteristics" on page 442. The congestion characteristic is dynamically determined by a network node.

Network nodes get the characteristics of links to non-adjacent end nodes and low entry networking end nodes during directory services search processing. For a link to be acceptable for a given class of service, each characteristic for the link must be greater than or equal to the minimum value and less than or equal to the maximum value for the column. If a link is acceptable, it is assigned the weight associated with that column. Once every node and link between the origin and destination control points have been examined and assigned a weight, the set of links with the least weight (according to the COS selected) will be used for the session path.

Notes:

1. If a link or node has characteristics that are not within the range for any of the eight columns in a COS, that link or node cannot be used by the COS. A link or node may be unacceptable because of either its configured values or because of dynamic characteristics.
2. If there is more than one route that supplies the lowest weight between the origin and destination control points, then a route will be selected at random. There is no consideration made as to the number of nodes and transmission groups traveled.

B.6.1 COS Information for the Advanced User

The ability to specify a mode name and COS table at session establishment time provides an increased amount of flexibility in terms of session characteristics and route selection. However, in many cases, such flexibility is not required.

IBM provides seven predefined mode names and corresponding COS tables. Two of these modes (SNASVCMG and CPSVCMG) are IBM-reserved names and are not available for modification. One of the remaining five IBM defined mode names is a mode name of *blank* and is represented internally as eight blank characters (X'40'). You can alter this association so that a COS name is associated with more than one mode name.

For more information on defining your own class of service and mode names, refer to the *SNA APPN and LEN Architecture Reference*, SC30-3422.

B.6.2 COS Table Entries in APPN Networks

An entry in an APPN COS table defines a single transmission priority and multiple columns of COS characteristics that are acceptable for that class of service. Within the table, two classes of service, each specifying the same COS characteristics but having different transmission priorities, is accepted and expected. These two classes of service allow two sessions to use the same route, but with one session having priority over the other.

In an APPN COS table, the order in which the columns of COS characteristics are listed is important. The various possible routes are assigned weights as specified in the columns, and the best routes must come first. The weights enable route selection services in the network node serving the logical unit (LU) to calculate the optimal route for the session.

B.7 Specifying COS Characteristics

The columns in an APPN COS table define both node and transmission group (TG) characteristics that are acceptable for the specified class of service. Each column defines either a set of node characteristics, or a set of TG characteristics.

B.7.1 TG Characteristics

The TG characteristics are:

Cost/Connect

The units of cost/connect time are user-defined and are the relative cost of being connected over the line. Non-switched lines have the lowest cost; switched lines have the highest cost. The valid range is 0-255.

Cost/Byte

The units of cost/byte are user-defined and are the relative cost per byte of sending and receiving data on the line. The valid range is 0-255.

User-Defined

You are allowed to define three additional characteristics to describe the transmission groups in your network.

Note: This characteristic is not defined on the 3174 but is used by other IBM products with APPN, such as the AS/400.

Link Speed

This is the data rate for the line. A numeric value from 0 through 13 is used; 0 indicates the minimum speed and 13 indicates the maximum speed.

The acceptable values for link speed are:

- 0 - Minimum
- 1 - 1.2 K
- 2 - 2.4 K
- 3 - 4.8 K
- 4 - 7.2 K

- 5 - 9.6 K
- 6 - 14.4 K
- 7 - 19.2 K
- 8 - 48.0 K
- 9 - 56.0 K
- 10 - 64.0 K
- 11 - 4 M
- 12 - 16 M
- 13 - Maximum

The corresponding values are displayed on the screen.

Security

This characteristic indicates the level of security protection available on a transmission group. There are seven levels of security associated with the various transmission media to provide uniformity across all networks. A numeric value from 0 through 6 is used; 0 indicates the minimum security and 6 indicates the maximum security.

The acceptable values for security are:

- 0 - Nonsecure
- 1 - Public Switched Network
- 2 - Underground Cable
- 3 - Secure Conduit
- 4 - Guard Conduit
- 5 - Encrypted
- 6 - Maximum

The corresponding values are displayed on the screen.

Propagation Delay

This indicates the time required for a signal to travel from one end of the transmission group to the other. A numeric value from 0 through 5 is used; 0 indicating minimum and 5 indicating maximum.

The corresponding values are displayed on the screen.

The acceptable values for propagation delay are:

- 0 - Minimum
- 1 - LAN
- 2 - Telephone
- 3 - Packet Switched Network
- 4 - Satellite
- 5 - Maximum

Effective Capacity

This characteristic expresses the highest bit transmission rate the TG supports.

These characteristics are used by APPN to select the best available route to satisfy your request for a session to a remote location.

For any given characteristic, the field representing it contains a range of acceptable values for the characteristic. For example, TG connect cost ranges from 0 to 255, with 0 representing the minimum connect cost. The range enables route selection services to compare the connect cost of an individual TG to the specified range to determine if the TG is acceptable for this class of service.

In addition to the set of node or TG characteristics, each column in a COS table entry contains a weight field. The weight field is used by route selection services when it is considering a particular node or TG for a route. The field can contain a constant numerical value only.

B.7.2 COS Names

Each class of service name has an associated transmission priority at which data must flow on routes constructed for the COS. Two or more different COS names may have the same COS definition.

The general meaning of the class of service names are as follows:

- #BATCH** A mode of the same name maps to this COS name. It is a general, batch-oriented class of service that uses low transmission priority. High bandwidth and low cost are considered more important than short delay.
- #BATCHSC** Same as #BATCH, except that a minimum security is required.
- #INTER** A mode of the same name maps to this COS name. It is a general, interactive-oriented class of service that uses high transmission priority. Short delay is considered to be more important than high bandwidth and low cost.
- #INTERSC** Same as #INTER, except that a minimum level of security is required.
- #CONNECT** For LU-LU sessions. This class of service provides connectivity at medium transmission priority. A mode name of all blanks map to the #CONNECT COS.

B.7.3 COS Mode Names

It has already been mentioned that a COS table is specified at session establishment. The means by which a COS table is specified is by a mode name which is specified at session establishment time; the mode name then points to a COS table to be used in route selection.

A total of 14 different mode names can be defined, nine of which are available for user definition. You have the option of creating other COS tables or mode names according to specific requirements which will be discussed, but this is not necessary in order to establish sessions in an APPN network. Unless you have applications with other mode names, you need not even consider modes and COS tables when using an APPN network.

B.7.4 Node Characteristics

There are three node characteristics that are used in route selection: route addition resistance (RAR), intermediate route resources (IRR), and congestion. The higher the value for RAR (valid range is 0 through 255), the less desirable the node becomes for intermediate session routing purposes. The 3174 uses a value of 128.

IRR is detected internally by APPN so that sessions can be directed away from a node when the configured maximum number of intermediate sessions allowed has been reached. A node is considered no longer depleted when the number of intermediate sessions drops below the maximum number. IRR depletion

allows additional sessions to be routed through a network node. You do not customize for IRR since it is detected internally.

Node congestion is automatically calculated by APPN when a large portion of the available buffers have been assigned. When congestion is detected, the NN will be less desirable in route calculation as an intermediate node. Node congestion will lessen the probability that additional sessions be routed through this node. Information about IRR depletion and node congestion is broadcasted to other NNs in the APPN network. This information is broadcasted each time an NN enters or leaves congestion or IRR depletion. This broadcasting of information keeps each NN in an APPN network updated. This permits dynamic route calculation to be done using the latest network information.

B.7.5 Route Selection Using COS

This section describes how route selection is performed.

Starting with each link originating at the session origin, all possible paths will be examined by comparing the characteristics of every link and node as compared to the characteristics contained in each column of the COS from column 1 to column 8 and proceeding until an acceptable column is found or until all eight columns are compared and none are found to be acceptable. For a link to be considered acceptable, every characteristic for the link must be greater than or equal to the minimum value and less than or equal to the maximum value for every characteristic in a single column. Refer to B.7, "Specifying COS Characteristics" on page 440 for details.

If one characteristic does not meet all values, the next column will be examined until a column is found that does meet all values or all columns have been exhausted. If all columns have been exhausted, then the link and/or node is considered unacceptable for this COS for this route calculation attempt. The characteristics of the node at the destination end of the link will also be examined to see if they meet the node COS value. The weight of the link added to the weight of the node at the destination end of the link will be used to obtain the weight of the hop.

After all of the links between the origin and destination control points have been examined and either were assigned a weight or found to be unacceptable, then the set of links and nodes that supplies the least path weight will be used for the route. Note that even though all links and nodes may be operational and communicating, a route request may fail if there is not a set path between the origin and destination control points that is acceptable for the COS.

Considerations for Route Selection: The following are considerations for route selection:

- The lower the weight for a node or link, the more desirable it is for the route calculation.
- Session control point origin and control point destination node weights are not added to the path weight.
- The IBM supplied COS defaults (described in B.7.2, "COS Names" on page 442) will be able to calculate a route for any line description except for *#BATCHSC* and *#INTERSC*, which require a minimum security, if the defaults are taken. This may not be true if they are changed during customization.

- When a link between NNs or nodes is being checked against the COS, the algorithm stops for that link or node as soon as all values have been satisfied. Subsequent columns will not be examined for performance reasons; therefore, you should customize your most desirable weights first.
- For the node COS, a value of LOW (0) means it is not congested, and a value of HIGH (1) means it is congested. Therefore, a minimum of LOW and a maximum of LOW in all columns means that a congested node is never acceptable for routing. If one of the supplied class of service definitions is changed to this or one is created with these values, a congested node is not chosen as part of the route.
- When a link between NNs becomes inoperative due to a failure, updates are sent around the network to inform all NNs of the condition so that subsequent session requests may be routed around the failed link or node. If and when the link becomes operative again, another update will be sent around the network nodes of the new condition. Note that at least a pair of active control point sessions is required for NNs to receive and send this information.

B.8 SNA Node Types

The SNA architecture is built upon the interaction of different types of communications nodes with defined roles. The SNA *node type* determines the role the node should play in communicating with other SNA nodes.

An SNA node is also referred to as a physical unit (PU). Thus, for example, a node type 2 (T2) may also be referred to as a PU2. Within a physical unit resides one or more logical units (LUs). There are a number of different LU types used for different purposes. Only the two key LU types discussed in this book are included in Table 17. Please refer to section B.10, "Independent versus Dependent Communications" on page 447 for more discussion on LU types. For those unfamiliar with SNA node and LU types, Table 17 provides a useful reference point for further discussion.

Table 17 (Page 1 of 2). Some SNA Node Types and Examples		
NODE TYPE	FUNCTION PERFORMED	EXAMPLE IBM PRODUCT
T5	Session services and routing	Host with VTAM (or SSCP)
T4	Intermediate node routing	Communications Controller with NCP (IBM 37XX)
T2	Services for locally attached LUs (screens attached to an IBM 3174)	<i>Small</i> system or remote cluster controller (IBM S/38 or IBM 3174)
T2.1	Support for communications between peer computers in a network without the control of a T5 host	IBM PS/2 or PC, IBM S/36, IBM S/38, IBM AS/400, AIX SNA Services. IBM 370 host with VTAM 3.2 (or later) and corresponding NCP appears as a T2.1 node to other T2.1 nodes
LEN	A T2.1 node (without the APPN extensions)	See T2.1
EN,NN	Extends T2.1 so that sessions may be started between non-adjacent peers	S/36 with APPN, AS/400, PS/2 with NS/2, 3174, DPPX/370, VTAM V4R1, AIX SNA Services
LU2	Protocol for 3270 terminal connections to the host via a 3270 controller	Supports 3278, 3192, 3472 connectivity via a 3174

<i>Table 17 (Page 2 of 2). Some SNA Node Types and Examples</i>		
NODE TYPE	FUNCTION PERFORMED	EXAMPLE IBM PRODUCT
LU6.2	Protocol for application-to-application communications between peer systems	Supports APPC programs (IBM programs: DSPT, DDM, or user-written programs)
APPC	Also known as LU 6.2	See LU 6.2

B.9 Node and LU Types

A LEN or APPN end node can be configured in the following ways:

- Attached to an APPN network node to gain access to the APPN network to which the network node provides entry.
- Attached to a subarea network through a boundary node. Attachment to a boundary node permits an APPN node to establish LU-LU sessions through the subarea network with LUs in subarea nodes or in other APPN nodes attached to boundary nodes.

In a T2.1 network, any node can control the establishment and ending of sessions and application program transactions without depending on a controlling host system.

The types of T2.1 nodes are:

- LEN
- End nodes
- Network nodes

B.9.1 LEN End Nodes

A LEN end node is a node that implements the basic T2.1 end node protocols without the APPN enhancements obtained through CP-CP sessions. In a LEN end node, all potential connections with remote LUs are predefined by customization. The system customization specifies an LU name, the CP name of the adjacent node through which the LU can be accessed, and identification of the link directly attaching the LEN end node to that adjacent node. A LEN end node uses the advanced functions of APPN by predefined potential connections with remote LUs as if they existed at an adjacent network node. This network node, in turn, can automatically act as the LEN end node's network node server and locate the actual destination of the LU and select the best route to it.

B.9.2 End Nodes

An APPN end node operates in a peer environment for LU-LU sessions (using LU 6.2 protocols) while providing additional APPN functions. An APPN end node provides APPN functions such as limited directory services and topology and route selection services to end users at its own node. It may participate in the APPN network by using the services of an attached network node server for session requests that involve node not directly connected; it does this by exchanging requests and replies for directory services with an adjacent network node (its server) using CP-CP sessions.

APPN end nodes also can register their local LUs with their network node server. This alleviates the network operator at the network node server from

having to predefine the LU names for the LUs in all the attached end nodes for which the network node provides services. For services provided by network nodes, refer to 1.4, “3174 Network Node Services” on page 14.

An APPN end node can be attached to multiple network nodes, but may have CP-CP sessions active with only one network node at a time; the others may be backup servers. Attachment of multiple network nodes allows the network node server to be changed, for example, for backup purposes. CP-CP sessions are never established by an APPN end node to other directly attached end nodes.

B.9.3 Network Nodes

An APPN network node supports its own end users. It also provides directory, route selection, and management services to end nodes, and performs intermediate routing of data on sessions that travel across it. An APPN network node performs distributed searches of the network to locate remote LUs and calculates the best route from origin node to destination node based on user-specified criteria.

A network node server refers to the role of a network node in acting as the network entry point for specific end nodes attached to it; these end nodes are defined as being in its domain. For example, all directory requests regarding resources (such as LUs) in these end nodes (as well as its own resources) pass through directory services in the network node server. In that way, the network nodes are able to collect and control directory information that passes into the APPN network.

An APPN network node provides the following services:

- LU-LU session services for its locally resident LUs
- Intermediate session routing
- Network server functions (to perform network directory searches and route selection) for attached APPN or LEN end nodes (as well as for its own locally resident LUs)
- Management services focal point or relay services for network problem management

B.9.4 LU Types

A node type can contain logical units (LUs). The LU supports sessions with control points and with LUs in other nodes.

End users access SNA networks through logical units. A logical unit manages the exchange of data between end users, acting as an intermediary between the end user and the network. A one-to-one relationship does not exist between end users and LUs. The number of end users that can access a network through the same LU is an implementation design option.

Before end users can communicate with one another, their respective LUs must be connected in a session. Multiple, concurrent sessions between the same two logical units are possible. When such sessions are activated, they are called parallel sessions, which are provided in LU 6.2 only.

SNA defines different kinds of logical units called LU types. LU types identify sets of SNA functions that support end-user communication. LU types supported in the 3174 are:

- LU type 1 is a session between an application program and a single terminal or printer using an SNA character string.
- LU type 2 is for sessions between an application program and a single terminal using the 3270 data stream.
- LU type 3 is for a session between an application program and a single printer using the 3270 data stream.
- LU type 6.2 is for transaction programs communicating in a distributed environment using the SNA general data stream (GDS) or user-defined data stream.

LU types 1, 2, and 3 are dependent on an SSCP. LU 6.2 can be dependent on an SSCP in a subarea environment using PU 2.0 or independent of the SSCP using T2.1. For APPN, LU 6.2 is the only independent LU type supported.

LU-LU sessions can exist only between logical units of the same LU types. For example, an LU type 2 can communicate only with another LU type 2; it cannot communicate with an LU type 3.

B.10 Independent versus Dependent Communications

When considering connectivity options to an SNA subarea network, it is useful to group the kinds of connectivity which may be performed into the following two categories:

1. Dependent communications
2. Independent communications

Understanding the characteristics of these two communications categories is key to understanding the possibilities for establishing sessions between APPN networks via a traditional subarea. This is important as APPN deals exclusively with independent communications. To clarify, we now consider the two terms briefly.

The term *dependent communications* refers to traditional SNA subarea communications. With dependent communications, a session may be established only by the host sending a BIND. The key usage for dependent communications is with *node types 2, or T2*. Dependent LU Server/Requester is an instance where the communications is dependent but the node type is *T2.1, or node type 2.1*. Node type 2 is the SNA terminology which refers to a 3270 control unit (for example, a 3174). When the control unit is a 3174 with DLUR capabilities, the 3174 is a network node of node type 2.1. Ordinary 3270 screens and printers communicate to the host by attaching to a 3270 control unit. These devices are referred to as LU types 2 and 1 or 3, respectively, and are the principle examples of dependent communications. LU type 0, used by the SNUF facility of the AS/400, is also an example of dependent communications. An LU which is used for dependent communications is given the name of *dependent LU*.

The term *independent communications* refers to SNA communications where the host need not have the responsibility for establishing a session; that is, where the host need not send the BIND, but rather is able to both send a BIND to and accept a BIND from another node. Any node, apart from the host, which is capable of sending a BIND is referred to as a *node type 2.1*. An LU which is used for independent communications is given the name of *independent LU*. The LU type used by independent LUs is LU 6.2 (APPC).

Appendix C. Interface Flows between APPN Nodes

This section provides an overview of the session establishment between control points (CP-CP sessions) and between LUs (LU-LU session) in an APPN network. For a detailed description, see *3174 Establishment Controller Functional Description*, GA23-0218. We have reproduced the charts that describe the interface flows between nodes at session establishment as a quick reference.

Figure 502 on page 450 provides an example showing CP-CP sessions between APPN network nodes in a token-ring network environment.

Figure 503 on page 451 provides an example showing CP-CP sessions between an APPN network node and an APPN end node in a token-ring network environment.

Figure 504 on page 452 provides an example showing an LU-LU 6.2 session between APPN end nodes and an APPN network node providing network node services in a token-ring network.

C.1.1 APPN NNs Establishing CP-CP Sessions

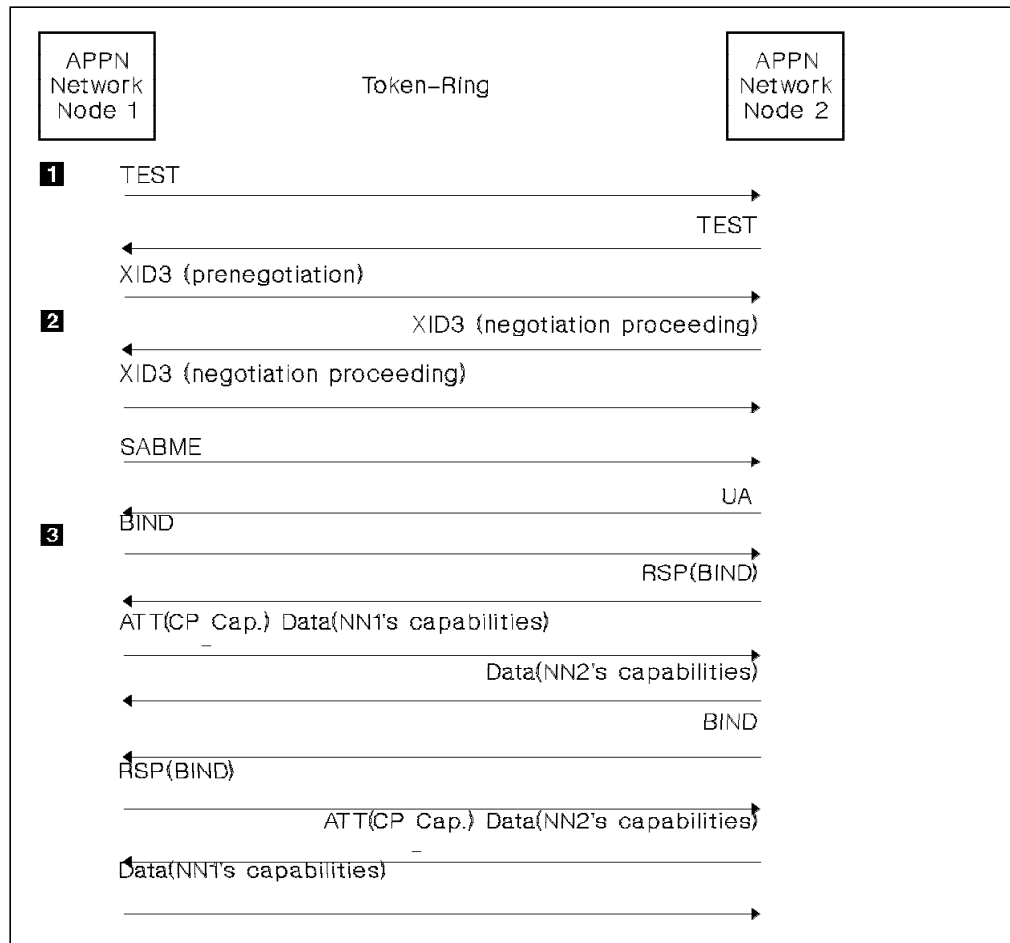


Figure 502. APPN NNs Establishing Parallel CP-CP Sessions

- 1** Connect Phase – Exchange of TEST commands allows initial establishment of communication between the token-ring nodes. The XID 3 prenegotiation is used to poll the adjacent link station to ensure that it is active. The CP Status field indicates that CP-CP sessions are supported. The APPN network nodes also compute the shortest token-ring routes between the nodes during this phase.
- 2** Contact Phase – During this phase, XID 3 negotiation is performed by the APPN nodes to identify themselves. The CP and adjacent link station names are learned, and node and transmission characteristics are conveyed to facilitate communication. Once the SABME and UA have been sent and RR has flowed on the link, the contact and link activation phase are complete and token-ring I-frame data can be sent.
- 3** CP-CP session establishment– The sender of a CP-CP session BIND considers the CP-CP session to be enabled when it receives the other node's CP capabilities. CP capabilities are encoded in the CP Capabilities GDS variable and includes information such as whether CP supports LOCATE/CDINIT search requests, provides directory services, supports resource registration, provides topology updates, and so on.

C.1.2 APPN NN and APPN EN Establishing CP-CP Sessions

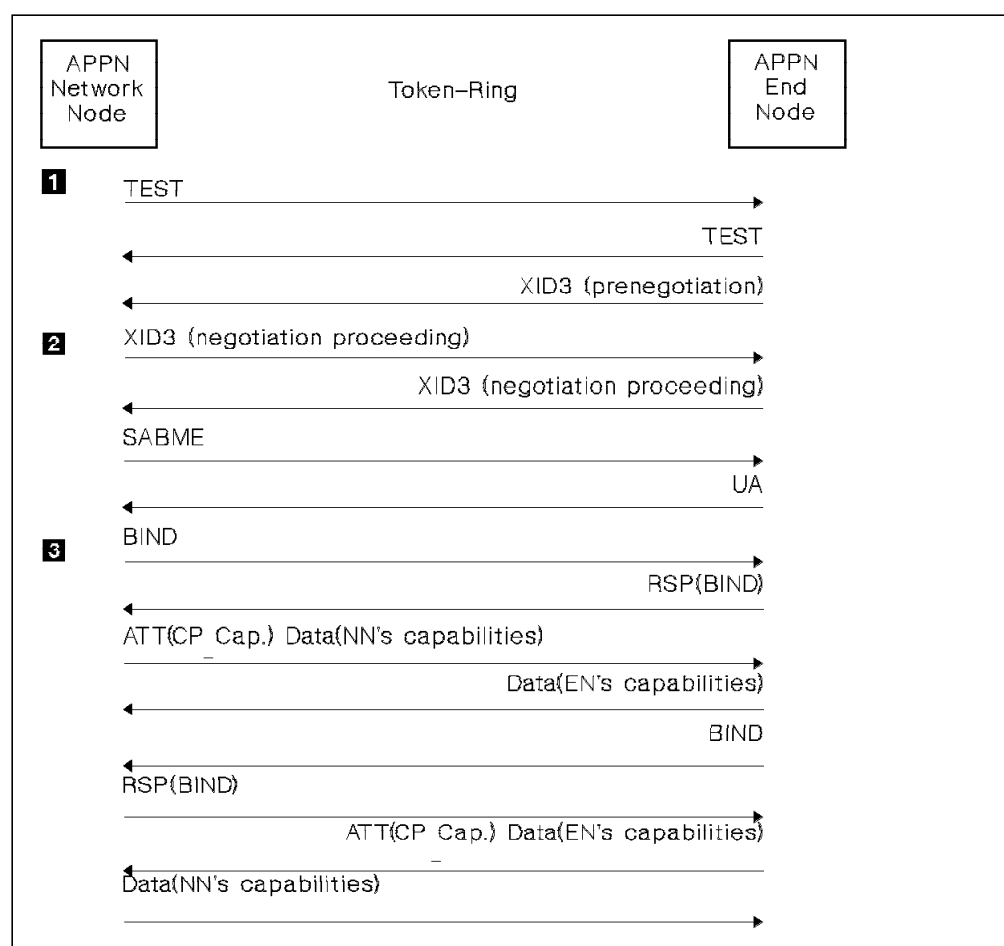


Figure 503. APPN NN and APPN EN Establishing Parallel CP-CP Sessions

Note

The frame numbers given in parentheses refer to the frame numbers.

- 1** Connect Phase – Exchange of TEST commands allows initial establishment of communication between the token-ring nodes (frame numbers 12 and 13). The XID 3 prenegotiation is used to poll the adjacent link station to ensure that it is active (frame numbers 16 and 17). The APPN end node indicates that it requires network services in the XID 3 CP Status field. The APPN nodes also compute the shortest token-ring routes between the two link stations during this phase.
- 2** Contact Phase – During this phase, XID 3 negotiation is performed by the APPN nodes to identify themselves (frame numbers 19 through 21). The CP and adjacent link station names are learned, and node and transmission characteristics are conveyed to facilitate communication. Once the SABME and UA (frame numbers 22 and 23) have been sent and RR has flowed on the link, the contact and link activation phase are complete and token-ring I-frame data can be sent.
- 3** CP-CP session establishment – The sender of a CP-CP session BIND (frame numbers 26 and 28) considers the CP-CP session to be enabled when it receives the other node's CP capabilities. CP capabilities are encoded in

the CP Capabilities GDS variable (frame numbers 38 through 48) and includes information such as whether CP supports LOCATE/CDINIT search requests, provides directory services, supports resource registration (frame number 54), provides topology updates, and so on. CP-CP session establishment between an end node and a network node is the same as the CP-CP session establishment previously described between two network nodes with the exception that end nodes have limited CP capabilities. Out of the list specified above for network nodes, the only CP capability an end node can specify is LOCATE/CDINIT search requests.

C.1.3 APPN Nodes Establishing an LU-LU Session

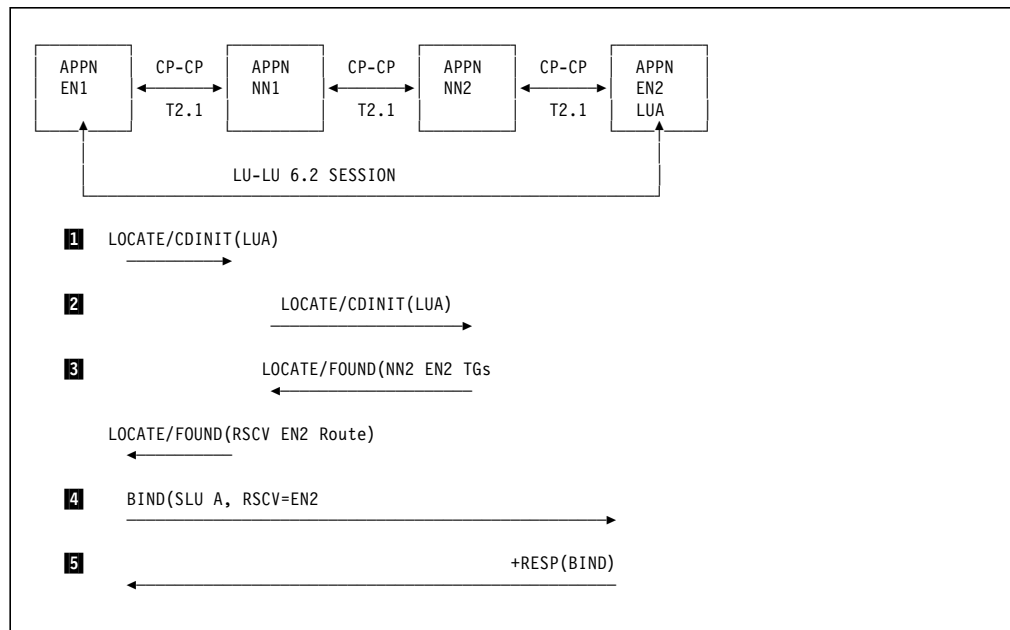


Figure 504. APPN Nodes Establishing an LU-LU 6.2 Session in a Connection Network

- 1** This scenario does not show the link activations or CP-CP session establishments between the APPN nodes. The link activations and CP-CP session establishments are similar to the two examples shown previously. APPN EN1 sends a LOCATE/CDINIT LUA to APPN NN1.
- 2** APPN NN1 determines that its local LU directory does not contain LUA as an entry. APPN NN1 builds a LOCATE/CDINIT that contains the FQPCID, the primary LU and secondary LU names, EN1's CP name, and NN1's CP name, and sends it to APPN NN2 with which it has a CP-CP session.
- 3** APPN NN2 knows about LUA and builds a LOCATE reply indicating that LUA is in APPN EN2 and its TG is EN2's token-ring MAC address and SSAP, and sends the reply to APPN NN1. APPN NN1 uses the TG vectors in conjunction with the topology database to compute the least weight route. In this case, since APPN EN2 is in the same connection network, the least weight route is the TG provided by APPN NN2. APPN NN1 sends the LOCATE/Found with the RSCV for APPN EN2 to APPN EN1.
- 4** APPN EN1 appends the RSCV to the BIND, after activating a link to EN2, and sends it to APPN EN2. The BIND contains the session parameters requested by the primary LU, as well as the secondary LU name and fully qualified PCID. EN1 does not support the COS tower in this scenario.

- 5** LUA accepts the BIND and a +RSP BIND is routed back to APPN EN1. The LU-LU session is established at this point and session traffic can flow directly between EN1 and EN2. APPN NN1 provided network node services for EN1 but is not acting as an intermediate node.

Appendix D. 3174 APPN Architecture Summary

Table 18 (Page 1 of 5). APPN Architecture Support in the 3174 NN

Number	Function	CS-C1	CS-C2	CS-C3	CS-C4	CS-C5	CS-C6
001	LEN-level XID3	X	X	X	X	X	X
002	All XID3 States	X	X	X	X	X	X
003	Link Station Role Negotiation	X	X	X	X	X	X
004	Multiple TGs to Subarea Network			X	X	X	X
005	DLC Independence	X	X	X	X	X	X
006	CP Name on XID3	X	X	X	X	X	X
007	TG Number Negotiation	-	-	X	X	X	X
008	Multiple TGs	X	X	X	X	X	X
010	Single-Link TG	X	X	X	X	X	X
011	LFSID Addressing	X	X	X	X	X	X
013	Priority Queuing for Transmission	X	X	X	X	X	X
014	Intranode Routing	X	X	X	X	X	X
020	Extended BIND and UNBIND	X	X	X	X	X	X
021	Adaptive Pacing for Independent LU BINDs	X	X	X	X	X	X
022	LFSID Management	X	X	X	X	X	X
023	BIND Segmenting and Reassembly	X	X	X	X	X	X
024	Adaptive Pacing for Dependent LU BINDs	-	-	-	-	X	X
030	CP-CP Sessions	X	X	X	X	X	X
031	CP Capabilities Exchange	X	X	X	X	X	X
032	Session Manager for a Local Independent LU 6.2	X	X	X	X	X	X
033	FQPCID Generation	X	X	X	X	X	X
034	Cdinit	X	X	X	X	X	X
035	Reconstruct Cdinit Reply	X	X	X	X	X	X
036	COS/TPF	X	X	X	X	X	X
037	BIND (ILU=PLU)	X	X	X	X	X	X
038	Limited Resource	X	X	X	X	X	X
039	BIND without RSCV from Any T2.1 Node	-	-	-	-	X	X
040	Propagate Unrecognized CVs	-	-	X	X	X	X
041	Session RU Segmenting and Reassembly	X	X	X	X	X	X
042	Interleaved Segments	X	X	X	X	X	X
050	Register EN Resources	X	X	X	X	X	X

Table 18 (Page 2 of 5). APPN Architecture Support in the 3174 NN

Number	Function	CS-C1	CS-C2	CS-C3	CS-C4	CS-C5	CS-C6
051	Locate/Find/Found	X	X	X	X	X	X
052	Reconstruct Locate Reply	X	X	X	X	X	X
053	Participate in Network Searches	X	X	X	X	X	X
054	Send/Receive Wildcard Reply	X	X	X	X	X	X
055	Broadcast and Directed Searches	X	X	X	X	X	X
056	ENCP Search Control	X	X	X	X	X	X
057	Partial Directory Entries	-	-	X	X	X	X
058	EN Authorization	X	X	X	X	X	X
059	Accept Unqualified LU Name	X	X	X	X	X	X
060	Locate Chains — Locate(keep)	X	X	X	X	X	X
061	Sending Locate to a Gateway	-	-	-	-	-	-
062	Cache Resource Locations	X	X	X	X	X	X
063	Favor Explicit Replies	X	X	X	X	X	X
064	Fully-Qualified LU Names	X	X	X	X	X	X
065	Central Directory Client	-	-	-	-	X	X
066	Abbreviated Resource Hierarchy	X	X	X	X	X	X
068	Authentic NETID Indicators	-	-	X	X	X	X
069	DS Support for Domain LEN Resources	-	-	X	X	X	X
070	Process Local Resource Change	X	X	X	X	X	X
071	Local Topology Database Queries	X	X	X	X	X	X
072	Process Route Requests	X	X	X	X	X	X
073	Initial Topology Exchange	X	X	X	X	X	X
074	Flow Reduction Sequence Numbers	X	X	X	X	X	X
075	Resource Sequence Numbers	X	X	X	X	X	X
076	Topology Broadcast	X	X	X	X	X	X
077	Garbage Collection	X	X	X	X	X	X
078	Topology Isolation at NETID Boundaries	X	X	X	X	X	X
079	Build RSCV	X	X	X	X	X	X
080	Calculate Route Using Connection Networks	X	X	X	X	X	X
081	Class-of-Service Manager	X	X	X	X	X	X
082	Route Randomization	X	X	X	X	X	X
083	Member of Connection Network	X	X	X	X	X	X
084	Select One-Hop Routes	X	X	X	X	X	X

Table 18 (Page 3 of 5). APPN Architecture Support in the 3174 NN							
Number	Function	CS-C1	CS-C2	CS-C3	CS-C4	CS-C5	CS-C6
085	Select Network Routes	X	X	X	X	X	X
090	Common Node Operator Command Set	X	X	X	X	X	X
091	Network Node Operator Command Set	X	X	X	X	X	X
100	Extend/Unextend BIND and UNBIND	X	X	X	X	X	X
101	Fixed Session Pacing	X	X	X	X	X	X
102	Adaptive Session Pacing	X	X	X	X	X	X
103	Intermediate Session Segmenting/Reassembly	X	X	X	X	X	X
104	Routing BIND and UNBIND	X	X	X	X	X	X
105	ISR for Dependent LU Sessions	-	-	X	X	X	X
106	ISR for Type 6.2 LU-LU Sessions	X	X	X	X	X	X
150	Common Base	-	-	-	-	X	X
151	End Node Support	-	-	-	-	-	-
152	Network Node Support	-	-	-	-	X	X
153	High Performance Option	-	-	-	-	-	-
154	Transport Confirmation Option	-	-	-	-	-	-
160	Base End Node Support	-	-	-	-	-	-
161	Have a Backup or Implicit Focal Point (F/P)	-	-	-	-	X	X
162	Be a Sphere of Control (SOC) End Node	-	-	-	-	-	-
163	Base Network Node Support	-	-	-	-	X	X
164	Have a Subarea FP	X	X	X	X	X	X
165	Be a Subarea FP	X	X	X	X	X	X
166	Have Multiple Backup FPs	-	-	-	-	-	-
167	FP with Multiple Backups	-	-	-	-	-	-
170	Base Subset	-	-	-	-	X	X
171	Problem Diagnosis Data	-	-	-	-	-	-
172	Delayed Alert	X	X	X	X	X	X
173	Held Alert for PU Management Services (PUMS)	X	X	X	X	X	X
174	Operator-Initiated Alert	X	X	X	X	X	X
175	Qualified Message Data	-	-	-	-	-	-
176	Self-Defining Message Text Subvector	-	-	-	-	-	-
177	LAN Alert	X	X	X	X	X	X
178	SDLC/LAN LLC Alert	-	-	-	-	-	-

Table 18 (Page 4 of 5). APPN Architecture Support in the 3174 NN							
Number	Function	CS-C1	CS-C2	CS-C3	CS-C4	CS-C5	CS-C6
179	X.21 Alert	-	-	-	-	-	-
180	Hybrid Alert	-	-	-	-	-	-
181	X.25 Alert	-	-	-	-	-	-
182	Held Alert for CP MS	X	X	X	X	X	X
183	Resolution Notification Support	-	-	-	-	-	-
184	Operations Management Support	-	-	-	-	-	-
1001	Secondary-Initiated Non-Activation XID	X	X	X	X	X	X
1002	Adjacent Link Station Name	X	X	X	X	X	X
1003	Short Hold Mode	-	-	-	-	-	-
1004	Adjacent Node Name-Change	-	-	X	X	X	X
1006	SSCP Takeover	-	-	X	X	X	X
1007	Parallel TGs	-	-	X	X	X	X
1011	Multiple Local LUs	-	-	-	-	-	-
1012	LU Name = CP Name	X	X	X	X	X	X
1013	Interoperability with peripheral Border Node	-	-	-	-	X	X
1014	Peripheral Border Node	-	-	-	-	-	-
1015	Network Node Server Selection Enhancements	-	-	-	-	-	-
1016	Extended border node	-	-	-	-	-	-
1017	Gateway	-	-	-	-	-	-
1018	Delete EN Resources before Registering	-	-	-	-	-	-
1060	Prerequisites for Session Services Extensions	-	-	-	-	-	-
1062	Session Services Extensions CP Support	-	-	-	-	-	-
1063	Session Services Extensions NNS Support	-	-	-	-	-	-
1064	Session Services Extensions PLU Node Support	-	-	-	-	-	-
1065	Session Services Extensions CP(SLU) (SSCP) Support	-	-	-	-	-	-
1066	Dependent LU Server	-	-	-	-	-	-
1067	Dependent LU Requester	-	-	-	-	X	X
1068	Non-Persistent CP-CP Sessions	-	-	-	-	-	-
1069	Interchange Node	-	-	-	-	-	-
1070	Session Cryptography	-	-	-	-	-	-
1100	Safe-Store of Directory Cache	X	X	X	X	X	X
1101	Preloaded Directory Cache	X	X	X	X	X	X

Table 18 (Page 5 of 5). APPN Architecture Support in the 3174 NN							
Number	Function	CS-C1	CS-C2	CS-C3	CS-C4	CS-C5	CS-C6
1102	EN Authorization	-	-	-	-	-	-
1103	Retry Referred Search	-	-	-	-	-	-
1104	Topology-Based Directory Nonverify	X	X	X	X	X	X
1105	PCID Modifier	-	-	-	-	-	-
1106	Central Directory Server	-	-	-	-	-	-
1107	Central Resource Registration	-	-	-	-	-	-
1108	Non-Verify	-	-	-	-	-	-
1109	Surrogate Owner	-	-	X	X	X	X
1110	Uservar	-	-	-	-	-	-
1111	Uservar Extensions for Network Nodes and End Nodes	-	-	-	-	-	-
1112	Uservar Extensions for Central Resource Registration	-	-	-	-	-	-
1113	Uservar Extensions for Central Directory Server	-	-	-	-	-	-
1114	Uservar Extensions for peripheral border Node	-	-	-	-	-	-
1115	Uservar Extensions for extended border Node	-	-	-	-	-	-
1200	Tree Caching and TG Caching	-	-	-	-	-	-
1201	Permanent Storage Medium	-	-	-	-	-	-
1202	Safe-Store of Topology Database	-	-	-	-	-	-
1300	Initial Pacing Tuning Values	-	-	-	-	-	-
1301	Non-paced Intermediate Session Traffic	-	-	-	-	-	-
1500	EP File Services Support	X	X	X	X	X	X
1501	EP Change Management	-	-	-	-	-	-
1502	EP Common Operations Services	-	-	-	-	-	-
1503	EP Operations Management	-	-	-	-	-	-
1510	SNA/MS Change Management Base	X	X	X	X	X	X
1511	SNA/MS Change Management Production Only Activate	X	X	X	X	X	X

Appendix E. IBM Default COS Tables

The following panels contain the values supplied by IBM for COS definitions #BATCH, #BATCHSC, #INTER, #INTERSC and #CONNECT.

In addition to these five definitions, IBM supplies definitions for two more classes of service (CPSVCMG and SNASVCMG). The definitions for these are not able to be displayed and are reserved for internal use only. These definitions currently have the same values as those provided for #CONNECT with the exception that they have a transmission priority of *network* (*not* one of the options provided on COS Node Definition Panel). The mode names corresponding to these classes of service are the same as the class of service names.

E.1 #BATCH

COS Node Definition									
COS Name = #BATCH									
Transmission Priority (1,2,3) = 3									
		1	2	3	4	5	6	7	8
Node Weight (0-255)		_5	_10	_20	_40	_60	_80	120	160
Route Addition Resistance (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_31	_63	_95	127	159	191	223	255
Congestion (0,1)	Min	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	1	1
PF: 3=Quit 4=Default 8=Fwd									

Figure 505. IBM-Supplied Node Definition Defaults - #BATCH

COS Transmission Group Definition									
COS Name = #BATCH__		1	2	3	4	5	6	7	8
TG Weight (0-255)		_30	_60	_90	120	150	180	210	240
Cost/Connect (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	196	196	255
Cost/Byte (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	196	196	255
User-Defined 1 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 2 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 3 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 506. IBM-Supplied TG Definition Defaults - #BATCH

COS Transmission Group Definition Continued									
COS Name = #BATCH__		1	2	3	4	5	6	7	8
Link Speed	Min	9	7	7	5	5	5	3	0
	Max	13	13	13	13	13	13	13	13
(0=MIN 1=1.2K 2=2.4K 3=4.8K 4=7.2K 5=9.6K 6=14.4K 7=19.2K 8=48K 9=56K 10=64K 11=4M 12=16M 13=MAX)									
Security	Min	0	0	0	0	0	0	0	0
	Max	6	6	6	6	6	6	6	6
(0=NONSECURE 1=PUBSWTNET 2=UNDRGRDCB 3=SECURECND 4=GUARDCND 5=ENCRYPTED 6=MAX)									
Propagation Delay	Min	0	0	0	0	0	0	0	0
	Max	5	5	5	5	5	5	5	5
(0=MIN 1=LAN 2=TELEPHONE 3=PKTSWTNET 4=SATELLITE 5=MAX)									
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 507. IBM-Supplied TG Definition Continued Defaults - #BATCH

E.2 #BATCHSC

COS Node Definition									
COS Name = #BATCHSC									
Transmission Priority (1,2,3) = 3									
		1	2	3	4	5	6	7	8
Node Weight (0-255)		_5	_10	_20	_40	_60	_80	120	160
Route Addition Resistance (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_31	_63	_95	127	159	191	223	255
Congestion (0,1)	Min	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	1	1
PF: 3=Quit 4=Default 8=Fwd									

Figure 508. IBM-Supplied Node Definition Defaults - #BATCHSC

COS Transmission Group Definition									
COS Name = #BATCHSC									
		1	2	3	4	5	6	7	8
TG Weight (0-255)		_30	_60	_90	120	150	180	210	240
Cost/Connect (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	196	196	255
Cost/Byte (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	196	196	255
User-Defined 1 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 2 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 3 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 509. IBM-Supplied TG Definition Defaults - #BATCHSC

COS Transmission Group Definition Continued									
COS Name = #BATCHSC									
		1	2	3	4	5	6	7	8
Link Speed	Min	<u>9</u>	<u>7</u>	<u>7</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>3</u>	<u>0</u>
	Max	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>
(0=MIN 1=1.2K 2=2.4K 3=4.8K 4=7.2K 5=9.6K 6=14.4K 7=19.2K 8=48K 9=56K 10=64K 11=4M 12=16M 13=MAX)									
Security	Min	1	1	1	1	1	1	1	0
	Max	6	6	6	6	6	6	6	6
(0=NONSECURE 1=PUBSWTNET 2=UNDRGRDCB 3=SECURECND 4=GUARDCND 5=ENCRYPTED 6=MAX)									
Propagation Delay	Min	0	0	0	0	0	0	0	0
	Max	5	5	5	5	5	5	5	5
(0=MIN 1=LAN 2=TELEPHONE 3=PKTSWTNET 4=SATELLITE 5=MAX)									
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 510. IBM-Supplied TG Definition Continued Defaults - #BATCHSC

E.3 #INTER

COS Node Definition									
COS Name = #INTER									
Transmission Priority (1,2,3) = 1									
		1	2	3	4	5	6	7	8
Node Weight (0-255)		<u>5</u>	<u>10</u>	<u>20</u>	<u>40</u>	<u>60</u>	<u>80</u>	120	160
Route Addition Resistance (0-255)	Min	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	Max	<u>31</u>	<u>63</u>	<u>95</u>	127	159	191	223	255
Congestion (0,1)	Min	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	1	1
PF: 3=Quit 4=Default 8=Fwd									

Figure 511. IBM-Supplied Node Definition Defaults - #INTER

COS Transmission Group Definition									
COS Name = #INTER__		1	2	3	4	5	6	7	8
TG Weight (0-255)		_30	_60	_90	120	150	180	210	240
Cost/Connect (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	_0	196	255
Cost/Byte (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	_0	196	255
User-Defined 1 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 2 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 3 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 512. IBM-Supplied TG Definition Defaults - #INTER

COS Transmission Group Definition Continued									
COS Name = #INTER		1	2	3	4	5	6	7	8
Link Speed	Min	11	_9	_9	_7	_7	_5	_5	_0
	Max	13	13	13	13	13	13	13	13
(0=MIN 1=1.2K 2=2.4K 3=4.8K 4=7.2K 5=9.6K 6=14.4K 7=19.2K 8=48K 9=56K 10=64K 11=4M 12=16M 13=MAX)									
Security	Min	0	0	0	0	0	0	0	0
	Max	6	6	6	6	6	6	6	6
(0=NONSECURE 1=PUBSWTNET 2=UNDRGRDCB 3=SECURECND 4=GUARDCND 5=ENCRYPTED 6=MAX)									
Propagation Delay	Min	0	0	0	0	0	0	0	0
	Max	1	2	2	2	3	3	5	5
(0=MIN 1=LAN 2=TELEPHONE 3=PKTSWTNET 4=SATELLITE 5=MAX)									
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 513. IBM-Supplied TG Definition Continued Defaults - #INTER

E.4 #INTERSC

COS Node Definition									
COS Name = #INTERSC									
Transmission Priority (1,2,3) = 1									
		1	2	3	4	5	6	7	8
Node Weight (0-255)		_5	_10	_20	_40	_60	_80	120	160
Route Addition Resistance (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_31	_63	_95	127	159	191	223	255
Congestion (0,1)	Min	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	1	1
PF: 3=Quit 4=Default 8=Fwd									

Figure 514. IBM-Supplied Node Definition Defaults - #INTERSC

COS Transmission Group Definition									
COS Name = #INTERSC									
		1	2	3	4	5	6	7	8
TG Weight (0-255)		_30	_60	_90	120	150	180	210	240
Cost/Connect (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	_0	196	255
Cost/Byte (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	128	_0	128	_0	196	255
User-Defined 1 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 2 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 3 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 515. IBM-Supplied TG Definition Defaults - #INTERSC

COS Transmission Group Definition Continued									
COS Name = #INTERSC									
		1	2	3	4	5	6	7	8
Link Speed	Min	11	9	9	7	7	5	5	0
	Max	13	13	13	13	13	13	13	13
(0=MIN 1=1.2K 2=2.4K 3=4.8K 4=7.2K 5=9.6K 6=14.4K 7=19.2K 8=48K 9=56K 10=64K 11=4M 12=16M 13=MAX)									
Security	Min	1	1	1	1	1	1	1	1
	Max	6	6	6	6	6	6	6	6
(0=NONSECURE 1=PUBSWTNET 2=UNDRGRDCB 3=SECURECND 4=GUARDCND 5=ENCRYPTED 6=MAX)									
Propagation Delay	Min	0	0	0	0	0	0	0	0
	Max	1	2	2	2	3	3	5	5
(0=MIN 1=LAN 2=TELEPHONE 3=PKTSWTNET 4=SATELLITE 5=MAX)									
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 516. IBM-Supplied TG Definition Continued Defaults - #INTERSC

E.5 #CONNECT

COS Node Definition									
COS Name = #CONNECT									
Transmission Priority (1,2,3) = 2									
		1	2	3	4	5	6	7	8
Node Weight (0-255)		5	10	20	40	60	80	120	160
		5	10	20	40	60	80	120	160
Route Addition Resistance (0-255)	Min	0	0	0	0	0	0	0	0
	Max	31	63	95	127	159	191	223	255
Congestion (0,1)	Min	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	1	1
PF: 3=Quit 4=Default 8=Fwd									

Figure 517. IBM-Supplied Node Definition Defaults - #CONNECT

COS Transmission Group Definition									
COS Name = #CONNECT									
		1	2	3	4	5	6	7	8
TG Weight (0-255)		_30	_60	_90	120	150	180	210	240
Cost/Connect (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	_0	_0	_0	128	196	255
Cost/Byte (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	_0	_0	_0	_0	_0	128	196	255
User-Defined 1 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 2 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
User-Defined 3 (0-255)	Min	_0	_0	_0	_0	_0	_0	_0	_0
	Max	255	255	255	255	255	255	255	255
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 518. IBM-Supplied TG Definition Defaults - #CONNECT

COS Transmission Group Definition Continued									
COS Name = #CONNECT									
		1	2	3	4	5	6	7	8
Link Speed	Min	11	_9	_7	_5	_7	_5	_3	_0
	Max	13	13	13	13	13	13	13	13
(0=MIN 1=1.2K 2=2.4K 3=4.8K 4=7.2K 5=9.6K 6=14.4K 7=19.2K 8=48K 9=56K 10=64K 11=4M 12=16M 13=MAX)									
Security	Min	0	0	0	0	0	0	0	0
	Max	6	6	6	6	6	6	6	6
(0=NONSECURE 1=PUBSWTNET 2=UNDRGRDCB 3=SECURECND 4=GUARDCND 5=ENCRYPTED 6=MAX)									
Propagation Delay	Min	0	0	0	0	0	0	0	0
	Max	1	2	2	2	3	3	5	5
(0=MIN 1=LAN 2=TELEPHONE 3=PKTSWTNET 4=SATELLITE 5=MAX)									
PF: 3=Quit 4=Default 7=Back 8=Fwd									

Figure 519. IBM-Supplied TG Definition Continued Defaults - #CONNECT

Appendix F. Supplemental Information for Scenarios

This appendix provides supplemental information for the scenarios presented in this document. This information has been placed here for reference purposes.

F.1 NCP/NPSI Generation for SVC and PVC Links

```
*****
*
*      OPTIONS NEWDEFN=(YES,ECHO,NOSUPP),USERGEN=(X25NPSI)
*CPOPT OPTIONS USERGEN=(X25NPSI,FNMNDFGN),FASTRUN=ON,NEWDEFN=YES
*
*****
*      PCCU'S      MACRO SPECIFICATIONS      *
*****
*
PCCUBE20 PCCU AUTODMP=YES,          ONLY ONE AUTODMP-HOST IF TWINTAIL *
              AUTOIPL=NO,          ONLY ONE AUTOIPL-HOST IF TWINTAIL *
              AUTOSYN=YES,         USE THE ALREADY LOADED NCP IF OK   *
              BACKUP=YES,          RESOURCE TAKEOVER PERMITTED        *
              CDUMPDS=NCPDCSP,     SCANNER DUMP DATASET                *
              CHANCON=COND,        CONDITIONAL CONTACT REQ. TO NCP SENT*
              CUADDR=E20,          CHANNEL ADDRESS                     *
              DUMPDS=NCPDUMP,      DUMP DATASET                        *
              MDUMPDS=NCPDMOSS,    MOSS DUMP DATASET                   *
              MAXDATA=5000,        *
              OWNER=M18,          *
              VFYLM=YES,          VERIFY LMOD WHEN LOADING            *
              SUBAREA=18          HOSTSA  VTAM VER 3 MVS/SP
*
PCCUKE20 PCCU AUTODMP=YES,          ONLY ONE AUTODMP-HOST IF TWINTAIL *
              AUTOIPL=NO,          ONLY ONE AUTOIPL-HOST IF TWINTAIL *
              AUTOSYN=YES,         USE THE ALREADY LOADED NCP IF OK   *
              BACKUP=YES,          RESOURCE TAKEOVER PERMITTED        *
              CDUMPDS=NCPDCSP,     SCANNER DUMP DATASET                *
              CUADDR=E20,          CHANNEL ADDRESS                     *
              CHANCON=COND,        CONDITIONAL CONTACT REQ. TO NCP SENT*
              DUMPDS=NCPDUMP,      DUMP DATASET                        *
              MDUMPDS=NCPDMOSS,    MOSS DUMP DATASET                   *
              MAXDATA=5000,        *
              OWNER=M20,          *
              VFYLM=YES,          VERIFY LMOD WHEN LOADING            *
              SUBAREA=20          HOSTSA  VTAM VER 3 MVS/XA
              STATOPT='SA08 3745'
*
*
*****
```

Figure 520 (Part 1 of 14). NCP/NPSI Definitions

```

*****
*      BUILD MACRO SPECIFICATIONS      *
*****
BUILD BFRS=(240),      NCP BUFFER SIZE      *
  ADDESS=300,      ALLOCATED SESSION CONTROL BLOCKS T2.1 *
  AUXADDR=300,      EXTRA ADDR. FOR ILU ACT AS PLU T2.1 *
  MEMSIZE=4M,      4M TO USE      *
  BRANCH=500,      BRANCH TRACE ENTRIES      *
  CATRACE=(YES,100),      CHANNEL ADAPTER TRACE      *
  CWALL=26,      MIN. BUFFERS BEFORE SLOWDOWN      *
  DSABLT=6.5,      *
  ENABLT=6.5,      IBM 386X REQUIRE 6.5 AS MINIMUM      *
  ERLIMIT=16,      *
  LTRACE=4,      SIT FOR 4 LINES      *
  LOADLIB=NCPLOAD,      NCP LOAD MODULE LIBRARY      *
  MAXSSCP=8,      8 SSCP'S CAN ACTIVATE THIS NCP      *
  MAXSESS=5000,      MAX NUMBER OF SESSIONS FOR ILU      *
  MODEL=3745,      3745 COMMUNICATION CONTROLLER      *
  NAMTAB=50,      MAX NUMBER SSCP,NETWORKS,CP T2.1      *
  NETID=USIBMRA,      REQUIRED      *
  NEWNAME=RA8NCKH,      NAME OF THIS LOAD MODULE      *
  NPA=(YES,DR),      NPA*      *
  NUMHSAS=50,      *
  PUNAME=RA8NCKH,      NAME OF THIS PU      *
  SUBAREA=08,      SUBAREA ADDRESS = 08      *
  TRACE=(YES,64),      64 ADDRESS-TRACE ENTRIES      *
  TYPGEN=NCP,      NCP ONLY      *
  TRANSFR=34,      NCP ONLY      *
  TYPSYS=MVS,      MVS OPERATING SYSTEM      *
  USGTIER=4,      NCP USAGE TIER      *
  VERSION=V7R1,      NDF VERSION INDICATOR      @3.*
  VRPOOL=500,      *
  X25.PREFIX=X,      ALL NAMES START WITH X      *
  X25.IDNUMH=2,      MUST MATCH WITH SWITCH MAJ.      @3.*
  X25.SNAP=NO,      SNAP TRACE NOT INCLUDED      *
  X25.MCHCNT=1,      NUMBER OF PHYSICAL LINKS      @3.*
  X25.MAXPIU=17K,      LESS THAN 255 TIMES BFRS      *
  X25.USGTIER=4,      NPSI USAGE TIER      ####
**
*****

```

Figure 520 (Part 2 of 14). NCP/NPSI Definitions

```

*****
*      SYSCNTRL MACRO SPECIFICATIONS      *
*****
SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCNTRL,RCOND,RECMD,RIMM*,
,NAKLIM,SESSION,SSPAUSE,XMTLMT,STORDSP,DLRID,RDEVQ)
*****
HOST INBFRS=10,      NCP BUFFERS ALLOCATION      *
MAXBFRU=34,          UP TO 34 VTAM BUFFERS SHIPPED *
UNITSZ=152,          VTAM IO BUFFERS SIZE      *
BFRPAD=0,            BUFFER PAD                  *
SUBAREA=(18)         LINK ATTACHED HOSTSA
HOST INBFRS=10,      NCP BUFFERS ALLOCATION      *
MAXBFRU=34,          UP TO 34 VTAM BUFFERS SHIPPED *
UNITSZ=152,          VTAM IO BUFFERS SIZE      *
BFRPAD=0,            BUFFER PAD                  *
SUBAREA=(20)         LINK ATTACHED HOSTSA
*****
*      DYNAMIC RECONFIGURATION POOL SPACE      *
*****
*
PUDRPOOL NUMBER=100      CAN ADD 8 PUS
*
LUDRPOOL NUMTYP1=200,    RESERVE 10 LUS ON PU.T1 PUS      *
NUMTYP2=500,            RESERVE 90 LUS ON PU.T2 PUS      *
NUMILU=200              NR OF INDEPENDENT LU'S
*****
*      PATH SPECIFICATIONS                      *
*****
PATH DESTSA=1,          *
ERO=(20,1),             *
VRO=0,                  *
VRPWS00=(2,120),VRPWS01=(2,120),VRPWS02=(2,120)
PATH DESTSA=3,          *
ERO=(3,1),              *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=5,          *
ERO=(5,8,5000,5000,5000,20000),
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=10,         *
ERO=(10,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=11,         *
ERO=(11,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=16,         *
ERO=(20,1),             *
VRO=0,                  *
VRPWS00=(2,120),VRPWS01=(2,120),VRPWS02=(2,120)
PATH DESTSA=17,         *
ERO=(20,1),             *
VRO=0,                  *
VRPWS00=(2,120),VRPWS01=(2,120),VRPWS02=(2,120)
PATH DESTSA=18,         *
ERO=(18,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=20,         *
ERO=(20,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=25,         *
ERO=(25,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
PATH DESTSA=28,         *
ERO=(28,1),             *
VRO=0,                  *
VRPWS00=(1,60),VRPWS01=(1,60),VRPWS02=(1,60)
*****

```

Figure 520 (Part 3 of 14). NCP/NPSI Definitions

```

*****
*          VIRTUAL GROUP FOR NPA          *
*****
*****
*          SDLCST STATEMENTS FOR CONFIGURABLE LINK STATIONS          *
*****
SDLO8PRI  SDLCST  GROUP=G08XPRI,          *
              MODE=PRI,                    *
              RETRIES=(7,3,5),              *
              MAXOUT=7,                    *
              PASSLIM=254                   *
*
SDLO8SEC  SDLCST  GROUP=G08XSEC,          *
              MODE=SEC,                    *
              RETRIES=(7),                  *
              MAXOUT=7,                    *
              PASSLIM=254                   *
*
G08NPA    GROUP LNCTL=SDLC,VIRTUAL=YES,NPARSC=YES          NPA
LO8NPA    LINE  ISTATUS=ACTIVE
*
PO8NPA    PU
*
TO8NPA1   LU  MAXCOLL=250
*
TO8NPA2   LU  MAXCOLL=250
*
TO8NPA3   LU
*
TO8NPA4   LU
*
TO8NPA5   LU
*
TO8NPA6   LU
*
TO8NPA7   LU
*
TO8NPA8   LU
*
*****
*          GROUP DEFINITION FOR SDLC SELECTION TABLE ENTRY          *
*****
*****
G08XPRI   GROUP LNCTL=SDLC,          *
              MODE=PRI,                    *
              REPLYTO=3,                    *
              ACTIVTO=180,                  *
              DIAL=NO,                      *
              RETRIES=(7,4,5),              *
              TYPE=NCP                      *
G08XSEC   GROUP LNCTL=SDLC,          *
              MODE=SEC,                    *
              REPLYTO=NONE,                 *
              ACTIVTO=180,                  *
              DIAL=NO,                      *
              RETRIES=(7,0,0),              *
              TYPE=NCP                     *
*
*****

```

Figure 520 (Part 4 of 14). NCP/NPSI Definitions

```

*****
*          GROUP MACRO SPECIFICATIONS FOR SDLC LINES          *
*****
G08S1  GROUP LNCTL=SDLC,      SYNCHRONOUS DATA LINK      *
        DUPLEX=FULL,         REQUEST TO SEND ALWAYS UP    *
        NRZI=YES,            *                             *
        REPLYTO=1,           1 SECOND FOR SDLC             *
        RETRIES=(7,4,5),     7 RETRY PER SECOND FOR 5 TIMES *
        TYPE=NCP             NCP ONLY                     *
*
*****
*          LINE MACRO SPECIFICATION      SDLC LINK 001  MULTIPPOINT      *
*****
L08001  LINE ADDRESS=(033,HALF),  FULL DUPLEX              *
        ANS=CONTINUE,           DON'T BREAK CROSS DOMAIN SESSIONS *
        NPACOLL=NO,              *                             *
        CLOCKNG=DIRECT,          *                             *
        ISTATUS=ACTIVE,          *                             *
        OWNER=M20,               *                             *
        DUPLEX=(FULL),           REQUEST TO SEND ALWAYS UP    *
        ETRATIO=30,              DEFAULT                     *
        SERVLIM=3,               *                             *
        SPEED=9600,              NPA AND SCANNER USE        #### *
        SRT=(,64)                *
*****
*          SERVICE MACRO SPECIFICATION FOR SDLC (LINE 143)          *
*****
        SERVICE ORDER=(P08001A,P08001B,P08001C)
*****
*          PU/LU SPECIFICATIONS FOR PU'S X25NET HPAD                *
*****
P08001A  PU ADDR=C1,          CLUSTER ADDRESS = 01          *
        MAXDATA=521,          MAXIMUM AMOUNT OF DATA        *
        MAXOUT=7,             MAX SDLC FRAMES BEFORE RESPONSE *
        PACING=0,             PACING SET BY BIND IMAGE        *
        PASSLIM=8,            *                             *
        PUDR=NO,              *                             *
        PUTYPE=2,              *                             *
        RETRIES=(,4,5),       7 RETRY PER SECOND FOR 5 TIMES *
        DISCNT=(NO),          (V) VTAM                        *
        ISTATUS=ACTIVE,       (V) VTAM                        *
        SSCPFM=USSSCS,       (V) VTAM                        *
        USSTAB=US327X,       (V) VTAM                        *
        VPACING=0,            (V) VTAM                        *
T08001A1 LU LOCADDR=2,        FIRST LU MUST BE LOCADDR=2    *
        MODETAB=MODEVR,DLOGMOD=VR03270,                      *
        ISTATUS=ACTIVE       (V) VTAM                        *
T08001A2 LU LOCADDR=3,        *                             *
        MODETAB=MODEVR,DLOGMOD=VR03270,                      *
        ISTATUS=ACTIVE       (V) VTAM                        *
T08001A3 LU LOCADDR=4,        *                             *
        MODETAB=MODEVR,DLOGMOD=VR03270,                      *
        ISTATUS=ACTIVE       (V) VTAM                        *
T08001A4 LU LOCADDR=5,        *                             *
        MODETAB=MODEVR,DLOGMOD=VR03270,                      *
        ISTATUS=ACTIVE       (V) VTAM                        *
T08001A5 LU LOCADDR=6,        *                             *
        MODETAB=MODEVR,DLOGMOD=VR03270,                      *
        ISTATUS=ACTIVE       (V) VTAM

```

Figure 520 (Part 5 of 14). NCP/NPSI Definitions

```

P08001B  PU ADDR=C2,          CLUSTER ADDRESS = 02          *
          MAXDATA=521,        MAXIMUM AMOUNT OF DATA      *
          MAXOUT=7,           MAX SDLC FRAMES BEFORE RESPONSE *
          PACING=0,           PACING SET BY BIND IMAGE       *
          PASSLIM=8,          *                               *
          PUDR=NO,            *                               *
          PUTYPE=2,           *                               *
          RETRIES=(,4,5),     7 RETRY PER SECOND FOR 5 TIMES *
          DISCNT=(NO),        (V) VTAM                      *
          ISTATUS=ACTIVE,     (V) VTAM                      *
          SSCPFM=USSSCS,      (V) VTAM                      *
          USSTAB=US327X,      (V) VTAM                      *
          VPACING=0           (V) VTAM                      *
T08001B1  LU LOCADDR=2,       FIRST LU MUST BE LOCADDR=2    *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001B2  LU LOCADDR=3,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001B3  LU LOCADDR=4,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001B4  LU LOCADDR=5,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001B5  LU LOCADDR=6,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
P08001C  PU ADDR=C3,          CLUSTER ADDRESS = 03          *
          MAXDATA=521,        MAXIMUM AMOUNT OF DATA      *
          MAXOUT=7,           MAX SDLC FRAMES BEFORE RESPONSE *
          PACING=0,           PACING SET BY BIND IMAGE       *
          PASSLIM=8,          *                               *
          PUDR=NO,            *                               *
          PUTYPE=2,           *                               *
          RETRIES=(,4,5),     7 RETRY PER SECOND FOR 5 TIMES *
          DISCNT=(NO),        (V) VTAM                      *
          ISTATUS=ACTIVE,     (V) VTAM                      *
          SSCPFM=USSSCS,      (V) VTAM                      *
          USSTAB=US327X,      (V) VTAM                      *
          VPACING=0           (V) VTAM                      *
T08001C1  LU LOCADDR=2,       FIRST LU MUST BE LOCADDR=2    *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001C2  LU LOCADDR=3,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001C3  LU LOCADDR=4,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001C4  LU LOCADDR=5,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
T08001C5  LU LOCADDR=6,       *                               *
          MODETAB=MODEVR,DLOGMOD=VR03270,                  *
          ISTATUS=ACTIVE      (V) VTAM                      *
**
*****

```

Figure 520 (Part 6 of 14). NCP/NPSI Definitions

```

*****
*
*
*****
*      LINE MACRO SPECIFICATION      INN LINK 002 DIRECT 3745 SA08      *
*****
L08002  LINE ADDRESS=(034,FULL),    LINE ADDRESS                      *
        CLOCKNG=EXT,                Clocked BY 7820                    *
        DUPLEX=FULL,                MODEM STRAPPING IS FULL            *
        IPL=NO,                     LOADING OVER THIS LINK CAN BE DONE *
        MONLINK=NO,                 MONITOR LINK FOR ACTPU          *
        NRZI=YES,                   *
        PAUSE=(0.2,2.8),            DEFAULT                          *
        SDLCST=(SDLO8PRI,SDLO8SEC), *
        RETRIES=(7,7,17),           TIME OUT OCCURS AFTER 4 MINUTES *
        SERVLIM=254,                *
        SPEED=9600,                  NPA USE ONLY                     *
        SRT=(,64),                  *
        ISTATUS=INACTIVE             INITIAL STATUS                    *
*****
*      PU MACRO SPECIFICATION FOR THE ADJACENT 3745 SA05      *
*****
P08002  PU MAXOUT=7,                MAX PIU'S SENT BEFORE RESP REQ *
        MODULO=8,                   *
        PUTYPE=4,                   PHYSICAL UNIT TYPE REMOTE 3725 *
        ISTATUS=INACTIVE,           INITIAL STATUS                  *
        TGN=1,                      TRANSMISSION GROUP 6             *
        ANS=CONTINUE                DON'T BREAK THE X-DOMAIN SESSIONS *
*
*****
*      LINE MACRO SPECIFICATION      SDLC LINK 003 P-T-P      *
*****
L08003  LINE ADDRESS=(035,HALF),    FULL DUPLEX                      *
        ANS=CONTINUE,              DON'T BREAK CROSS DOMAIN SESSIONS *
        NPACOLL=NO,                *
        CLOCKNG=DIRECT,            *
        ISTATUS=ACTIVE,            *
        DUPLEX=(FULL),             REQUEST TO SEND ALWAYS UP        *
        ETRATIO=30,                DEFAULT                          *
        OWNER=M20,                 *
        SERVLIM=3,                 *
        SPEED=9600,                NPA AND SCANNER USE          #### *
        SRT=(,64)                  *
*****
*      PU/LU SPECIFICATIONS FOR PU X25NET MANAGER PNA      *
*****
P08003A PU ADDR=C1,                CLUSTER ADDRESS = 01            *
        MAXDATA=265,              MAXIMUM AMOUNT OF DATA          *
        MAXOUT=7,                 MAX SDLC FRAMES BEFORE RESPONSE *
        PACING=0,                 PACING SET BY BIND IMAGE         *
        PASSLIM=8,                *
        PUDR=NO,                  *
        PUTYPE=2,                  *
        RETRIES=(,4,5),           7 RETRY PER SECOND FOR 5 TIMES *
        DISCNT=(NO),              (V) VTAM                        *
        ISTATUS=ACTIVE,           (V) VTAM                        *
        SSCPFM=USSSCS,           (V) VTAM                        *
        USSTAB=US327X,           (V) VTAM                        *
        VPACING=0,                (V) VTAM                        *
T08003A1 LU LOCADDR=2,           FIRST LU MUST BE LOCADDR=2      *
        MODETAB=MODEVR,DLOGMOD=VR03270, *
        ISTATUS=INACTIVE          (V) VTAM                        *
**
*****

```

Figure 520 (Part 7 of 14). NCP/NPSI Definitions

```

*****
* NPSI V3R3 CONNECTION TO X25NET
*****
      X25.NET DM=YES,
        CPHINDX=3,
        NETTYPE=1,
        OUHINDX=3,
        DONE=YES
*
      X25.VCCPT INDEX=1,
        MAXPKTL=128,
        VWINDOW=7,      PACKET LEVEL WINDOW 7
        INSLOW=(100,50)
*
      X25.VCCPT INDEX=2,
        MAXPKTL=512,
        VWINDOW=7,      PACKET LEVEL WINDOW 7
        INSLOW=(100,50)
*
      X25.VCCPT INDEX=3,      ON DCE/DTE LINKS TO IMPROVE THRUPUT
        MAXPKTL=1024,      MAX. PACKET SIZE = 4096
        VWINDOW=7,      MAX. WINDOW SIZE = 7
        INSLOW=(100,50)
*
      X25.OUFT INDEX=1
*
      X25.OUFT INDEX=2,OPTFACL=20AA
*****
* MCH TO X25NET
*****
L08000  X25.MCH ADDRESS=032,  CONTROLLER LINE ADDRESS
      ANS=CONT,
      AEFBYTE=(01,02,03),
      AEFCTCP=(01,02,03),
      CUDO=(NULL,F0,F1,F2,F3,CC),
      CONNECT=NO,
      CTCP=(00,00,01,02,03,04),
      DBIT=NO,
      DIRECT=YES,
      FRMLGTH=131,      128 + 3 (PACKET HEADER)
      FTPI=NO,
      GATE=GENERAL,
      IDBLKG=064,      LLC4:  IDBLK=064
      IDBLKP=065,      PAD :  IDBLK=065
      ITRACE=YES,
      LCGDEF=(0,20),  20 VC'S
      LCNO=NOTUSED,
      LLCLIST=(LLC0,LLC2,LLC3,LLC4,LLC5),
      LSPRI=NO,
      LUNAME=(L08000A1,L08000A2,L08000A3,L08000A4,L08000A5),
      MACB=(X08000X,X08000R),
      MBITCHN=NO,
      MWINDOW=7,      FRAME WINDOW
      NCPGRP=G08X1,
      NDRETRY=1,
      NPRETRY=7,
      PAD=INTEG,
      PKTMODL=8,
      PLPIGGYB=YES,
      PUNAME=P08000A,
      PWPROT=NO,
      SHM=YES,
      SDRTCNT=10,
      SDRTIME=20,
      SPEED=9600,
      SPNQLLC=NO,
      STATION=DTE,
      SUBADDR=NO,
      SVCINN=1,
      TDTIMER=1,
      TPTIMER=3,
      TTTIMER=1
*
      X25.LCG LCGN=0      LOGICAL CHANNEL GROUP 0
**
*****

```

Figure 520 (Part 8 of 14). NCP/NPSI Definitions


```

*****
*      PVC FOR 3174 VIA X25NET
*****
L08X01  X25.LINE TYPE=P,      1. PERMANENT VC      *
        COMMITO=4,              *
        DSTNODE=BNN,            *
        ISTATUS=ACTIVE,         *
        LCN=1,                  *
        LLC=LLC3,               *
        NCPGRP=G08X2,           *
        VCCINDX=1               *
P08X01A  X25.PU PUTYPE=2,      *
        ADDR=C1,                *
        MAXDATA=265,            *
        XID=YES,                *
        MAXOUT=7                *
T08X01A1 X25.LU LOCADDR=2      *
T08X01A2 X25.LU LOCADDR=3      *
T08X01A3 X25.LU LOCADDR=4      *
T08X01A4 X25.LU LOCADDR=5      *
T08X01A5 X25.LU LOCADDR=6      *
*
*****
*      PVC TO SA 08 INN
*****
L08X02  X25.LINE TYPE=P,      1. PERMANENT VC      *
        COMMITO=4,              *
        DSTNODE=INN,            *
        ISTATUS=INACTIVE,       *
        LCN=2,                  *
        LLC=LLC3,               *
        TRANSFR=34,             *
        VCCINDX=1               *
P08X02A  X25.PU PUTYPE=4,      2. PERMANENT VC      *
        MAXOUT=7,               *
        TGN=1,                  *
        XID=YES                 *
*
*****
*      SVCSC LINES FOR SHM
*****
L08X21  X25.LINE TYPE=S,      *
        DSTNODE=INN,            *
        ISTATUS=INACTIVE,       *
        TRANSFR=34,             *
        CALL=INOUT              *
P08X21A  X25.PU PUTYPE=4      *
*
*****
*      SVC' S 3 - 20 X25NET
*****
        X25.VC LCN=(3,20),      18 SWITCHED VC' S  *
        ANS=CONT,                SESSION CONTINUATION *
        CALL=INOUT,              *
        NCPGRP=G08X3,            *
        OUFINDX=1,                *
        TYPE=S,                  SWITCHED              *
        VCCINDX=1                *
*****
        X25.END
*****

```

Figure 520 (Part 9 of 14). NCP/NPSI Definitions

```

      IGNORE      * LINES BETWEEN IGNORE/NOIGNORE WILL BE REGENERATED
*****
* THE REUSE OPTION ON NEWDEFN KEYWORD WAS PROCESSED IN THIS GENERATION*
* DEFINITION.  GENERATION STATEMENTS LOCATED IN BETWEEN AND INCLUDING *
* THE IGNORE-NOIGNORE PAIRS MUST NOT BE CHANGED IN ANY WAY.          *
*****
* GENERATED BY X25NPSI
G08X2  GROUP DIAL=NO,
          LEVEL2=BALNAVL2,
          LEVEL3=BALNAVL3,
          LEVEL5=NCP,
          LINEADD=NONE,
          COMPTAD=NO,
          COMPOWN=YES,
          COMPSWP=NO,
          COMPACB=NO,
          LNCTL=SDLC,
          NPACOLL=NO,
          TIMER=(BALNATER,,BALNATST,BALNATLS),
          TYPE=NCP,
          USERID=(5688035,BALPBDT,NORECMS),
          XIO=(BALNAVLX,BALNAVXS,BALNAVXI,BALNAVXX)
*
* GENERATED BY X25NPSI
L08X01  LINE ISTATUS=ACTIVE,
          UACB=XA032001
*
* GENERATED BY X25NPSI
XC032001 SERVICE
* GENERATED BY X25NPSI
P08X01A  PU ADDR=C1,
          MAXDATA=265,
          PUTYPE=2,
          XID=YES,
          MAXOUT=7,
          PUDR=NO
*
* GENERATED BY X25NPSI
T08X01A1 LU LOCADDR=2,
          LUDR=NO
*
* GENERATED BY X25NPSI
T08X01A2 LU LOCADDR=3,
          LUDR=NO
*
* GENERATED BY X25NPSI
T08X01A3 LU LOCADDR=4,
          LUDR=NO
*
* GENERATED BY X25NPSI
T08X01A4 LU LOCADDR=5,
          LUDR=NO
*
* GENERATED BY X25NPSI
T08X01A5 LU LOCADDR=6,
          LUDR=NO
*
* GENERATED BY X25NPSI
X25P032B GROUP DIAL=NO,
          LEVEL2=BALNAVL2,
          LEVEL3=BALNAVL3,
          LEVEL5=NCP,
          LINEADD=NONE,
          COMPTAD=NO,
          COMPOWN=YES,
          COMPSWP=NO,
          COMPACB=NO,
          LNCTL=SDLC,
          NPACOLL=NO,
          TIMER=(BALNATER,,BALNATST,BALNATLS),
          TYPE=NCP,
          USERID=(5688035,BALPBDT,NORECMS),
          XIO=(BALNAVLX,BALNAVXS,BALNAVXI,BALNAVXX)

```

Figure 520 (Part 10 of 14). NCP/NPSI Definitions

```

* GENERATED BY X25NPSI
L08X02  LINE ISTATUS=INACTIVE,
      TRANSFR=34,
      UACB=XA032002
*
* GENERATED BY X25NPSI
XC032002 SERVICE
* GENERATED BY X25NPSI
P08X02A  PU TGN=1,
      PUTYPE=4,
      XID=YES,
      MAXOUT=7,
      PUDDR=NO
*
* GENERATED BY X25NPSI
G08X3    GROUP DIAL=YES,
      LEVEL2=BALNAVL2,
      LEVEL3=BALNAVL3,
      LEVEL5=NCP,
      LINEADD=NONE,
      COMPTAD=NO,
      COMPOWN=YES,
      COMPSWP=NO,
      COMPACB=NO,
      LINEAUT=YES,
      LNCTL=SDLC,
      NPACOLL=NO,
      TIMER=(BALNATER,,BALNATST,BALNATLS),
      TYPE=NCP,
      USERID=(5688035,BALSDT,NORECMS),
      XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
*
* GENERATED BY X25NPSI
XL032014 LINE CALL=INOUT,
      UACB=XA032014
*
* GENERATED BY X25NPSI
XP032014 PU NPACOLL=NO,
      ANS=CONT,
      PUTYPE=(1,2)
*
* GENERATED BY X25NPSI
XL032013 LINE CALL=INOUT,
      UACB=XA032013
*
* GENERATED BY X25NPSI
XP032013 PU NPACOLL=NO,
      ANS=CONT,
      PUTYPE=(1,2)
*
* GENERATED BY X25NPSI
XL032012 LINE CALL=INOUT,
      UACB=XA032012
*
* GENERATED BY X25NPSI
XP032012 PU NPACOLL=NO,
      ANS=CONT,
      PUTYPE=(1,2)
*
* GENERATED BY X25NPSI
XL032011 LINE CALL=INOUT,
      UACB=XA032011
*
* GENERATED BY X25NPSI
XP032011 PU NPACOLL=NO,
      ANS=CONT,
      PUTYPE=(1,2)
*
* GENERATED BY X25NPSI
XL032010 LINE CALL=INOUT,
      UACB=XA032010
*
* GENERATED BY X25NPSI
XP032010 PU NPACOLL=NO,
      ANS=CONT,
      PUTYPE=(1,2)
*
* GENERATED BY X25NPSI
XL03200F LINE CALL=INOUT,
      UACB=XA03200F

```

Figure 520 (Part 11 of 14). NCP/NPSI Definitions

* GENERATED BY X25NPSI	
XP03200F PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL03200E LINE CALL=INOUT,	*
UACB=XA03200E	
* GENERATED BY X25NPSI	
XP03200E PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL03200D LINE CALL=INOUT,	*
UACB=XA03200D	
* GENERATED BY X25NPSI	
XP03200D PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL03200C LINE CALL=INOUT,	*
UACB=XA03200C	
* GENERATED BY X25NPSI	
XP03200C PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL03200B LINE CALL=INOUT,	*
UACB=XA03200B	
* GENERATED BY X25NPSI	
XP03200B PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL03200A LINE CALL=INOUT,	*
UACB=XA03200A	
* GENERATED BY X25NPSI	
XP03200A PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL032009 LINE CALL=INOUT,	*
UACB=XA032009	
* GENERATED BY X25NPSI	
XP032009 PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL032008 LINE CALL=INOUT,	*
UACB=XA032008	
* GENERATED BY X25NPSI	
XP032008 PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL032007 LINE CALL=INOUT,	*
UACB=XA032007	
* GENERATED BY X25NPSI	
XP032007 PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL032006 LINE CALL=INOUT,	*
UACB=XA032006	
* GENERATED BY X25NPSI	
XP032006 PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	
* GENERATED BY X25NPSI	
XL032005 LINE CALL=INOUT,	*
UACB=XA032005	
* GENERATED BY X25NPSI	
XP032005 PU NPACOLL=NO,	*
ANS=CONT,	*
PUTYPE=(1,2)	

Figure 520 (Part 12 of 14). NCP/NPSI Definitions

```

* GENERATED BY X25NPSI
XL032004 LINE CALL=INOUT,
UACB=XA032004
* GENERATED BY X25NPSI
XP032004 PU NPACOLL=NO,
ANS=CONT,
PUTYPE=(1,2)
* GENERATED BY X25NPSI
X25S032C GROUP DIAL=YES,
LEVEL2=BALNAVL2,
LEVEL3=BALNAVL3,
LEVEL5=NCP,
LINEADD=NONE,
COMPTAD=NO,
COMPOWN=YES,
COMPSWP=NO,
COMPACB=NO,
LNCTL=SDLC,
NPACOLL=NO,
TIMER=(BALNATER,,BALNATST,BALNATLS),
TYPE=NCP,
USERID=(5688035,BALIBDT,NORECMS),
PUTYPE=4,
SHM=YES,
ACTIVTO=0.0,
BRKCON=NONE,
XIO=(BALNAVXL,BALNAVXS,BALNAVXI,BALNAVXK)
* GENERATED BY X25NPSI
L08X21 LINE ISTATUS=INACTIVE,
CALL=INOUT,
UACB=XA032GGH
* GENERATED BY X25NPSI
P08X21A PU PUTYPE=4
* GENERATED BY X25NPSI
G08X1 GROUP DIAL=NO,
BERPROC=BALNMBER,
COMPACB=YES,
COMPTAD=YES,
COMPOWN=YES,
COMPSWP=YES,
LEVEL2=BALNAML2,
LEVEL3=BALNAML3,
LEVEL5=NCP,
LNCTL=SDLC,
NPACOLL=NO,
TIMER=(BALLAP4,,BALLAP4,BALLAP4),
TYPE=NCP,
USERID=(5688035,BALMBDT,NORECMS,P),
XIO=(BALNAMXL,BALNAMXS,BALNAMXI,BALNAMXK)
* GENERATED BY X25NPSI
L08000 LINE ADDRESS=(032,FULL),
SPEED=9600,
XMONLNK=NO,
UACB=(X08000X,X08000R)
* GENERATED BY X25NPSI
XC032 SERVICE
* GENERATED BY X25NPSI
P08000A PU ADDR=01,
ANS=CONT,
MAXDATA=265,
NPACOLL=NO,
PUDR=NO,
XID=NO,
PUTYPE=1

```

Figure 520 (Part 13 of 14). NCP/NPSI Definitions

```

* GENERATED BY X25NPSI
L08000A1 LU LOCADDR=0,
      VPACING=2,
      ISTATUS=ACTIVE
* GENERATED BY X25NPSI
L08000A2 LU LOCADDR=1,
      VPACING=2,
      ISTATUS=ACTIVE
* GENERATED BY X25NPSI
L08000A3 LU LOCADDR=2,
      VPACING=2,
      ISTATUS=ACTIVE
* GENERATED BY X25NPSI
L08000A4 LU LOCADDR=3,
      VPACING=2,
      ISTATUS=ACTIVE
* GENERATED BY X25NPSI
L08000A5 LU LOCADDR=4,VPACING=2,ISTATUS=ACTIVE
      NOIGNORE * LINES BETWEEN IGNORE/NOIGNORE WILL BE REGENERATED
*****
*      CHANNEL ADAPTER LINKS      ###
*****
G08CA  GROUP LNCTL=CA,
      ISTATUS=INACTIVE  STOP VTAM ACTIVATING CHANNEL LINK
*****
C08CA1  LINE ADDRESS=00,      1ST CA. PHYSICAL POSITION 1
      CA=TYPE6-TPS,      8825 CHANNEL ADAPTOR TYPE
      CASDL=120,      INTERVAL BEFORE CHANNEL SLOWDOWN
      DELAY=0.0,      CHAN ATTN DELAY
      NCPCA=ACTIVE,      NATIVE SUBCHANNEL(NSC) ACTIVE
      TIMEOUT=120      INTERVAL BEFORE CHANNEL DISCONTACT
*      STATOPT=(' CA1 LINE ')
P08CA1  PU PUTYPE=5,      INTERMEDIATE SUBAREA FUNCTION
      TGN=1      MUST BE ONE FOR PU TYPE 5
      GENEND INIT=BALINIMD,
      UGLOBAL=BALNMGOP

```

Figure 520 (Part 14 of 14). NCP/NPSI Definitions

F.2 Trace of DLUR/S Connection Flow

Knowing the exchange of requests between DLUR and DLUS helps us a lot in understanding how DLUR/S works. It also makes problem determination easy. The best way to form such an understanding is by looking at a trace.

This section contains the traces and flows in the scenario shown in Chapter 13, “DLUR-DLUS and PLU on the Same Host” on page 201. A Sniffer Trace Analyzer tool was used to gather the data. It was connected between the SDLC links of CP31741 and RALYAS4A, the adjacent NN AS/400. Frame 1 starts with a BIND from CP31741 to establish his CPSVRMGR session to RAI. This shows that a CP-CP session already exists with the adjacent NN, RALYAS4A, and an ATTACH Locate for RAI has been successfully initiated.

Please refer to the latest *SNA Formats* manual, GA27-3136 for a list of the SNA commands and formats.

```

- - - - - Frame 1 - - - - -
0000 C4 98 2F 00 01 02 00 19 6B 81 00 31 00 13 07 B0 Dq.....a.....
                                1
0010 B0 50 B3 07 87 86 86 87 07 06 02 00 00 00 00 00 .&..gffg.....
0020 00 00 00 23 00 00 0F E4 E2 C9 C2 D4 D9 C1 4B C3 .....USIBMRA.C
0030 D7 F3 F1 F7 F4 F1 26 00 09 02 C3 D7 E2 E5 D9 D4 P31741....CPSVRM
                                2
0040 C7 D9 09 03 01 00 00 00 00 00 00 19 10 04 E4 E2 GR.....US
0050 C9 C2 D4 D9 C1 4B C3 D7 F3 F1 F7 F4 F1 00 0B E4 IBMRA.CP31741..U
0060 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 60 18 EE 4B 7A FF SIBMRA.RAI-....:
0070 1F E7 A4 F7 0F E4 E2 C9 C2 D4 D9 C1 4B C3 D7 F3 .Xu7.USIBMRA.CP3
0080 F1 F7 F4 F1 2C 0A 04 08 E2 D5 C1 E2 E5 C3 D4 C7 1741....SNASVCMG
                                3
0090 2B 36 03 01 17 46 15 80 15 10 E4 E2 C9 C2 D4 D9 .....USIBMR
                                4
00A0 C1 4B D9 C1 D3 E8 C1 E2 F4 C1 00 0F 46 0D 80 15 A.RALYAS4A.....
00B0 08 D9 C1 D3 E8 C1 E2 F4 C2 00 0E 46 0C 80 01 03 .RALYAS4B.....
00C0 D9 C1 C9 00 00 00 00 18 RAI.....
- - - - - Frame 2 - - - - -
0000 C4 B8 2D 00 00 01 00 00 83 01 00 00 00 01 D.....c.....
- - - - - Frame 3 - - - - -
0000 C4 BA 2F 00 02 01 00 19 EB 80 00 31 00 13 07 B0 D.....
                                5
0010 B0 50 B3 00 80 86 86 80 00 06 02 00 00 00 00 00 .&...ff.....
0020 00 00 00 23 00 00 00 22 00 09 02 C3 D7 E2 E5 D9 .....CPSVR
0030 D4 C7 D9 09 03 02 4B 7A FF 1F E7 A4 F7 0C 05 E4 MGR.....Xu7..U
0040 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 00 00 60 18 EE 4B SIBMRA.RAI-....:
0050 7A FF 1F E7 A4 F7 0F E4 E2 C9 C2 D4 D9 C1 4B C3 :..Xu7.USIBMRA.C
0060 D7 F3 F1 F7 F4 F1 2B 36 03 03 17 46 15 80 15 10 P31741.....
0070 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 D3 E8 C1 E2 F4 C1 USIBMRA.RALYAS4A
0080 00 0F 46 0D 80 15 08 D9 C1 D3 E8 C1 E2 F4 C2 00 .....RALYAS4B.
0090 0E 46 0C 80 01 03 D9 C1 C9 40 00 00 00 18 .....RAI ....
- - - - - Frame 4 - - - - -
0000 C4 DA 2E 00 01 02 00 01 0B 91 01 11 05 02 FF 00 D.....j.....
0010 03 D0 00 00 04 22 F0 F0 F6 00 00 00 00 54 15 00 .}....006.....
                                7
0020 00 11 2C 00 00 00 00 00 0B 80 00 41 02 3E 00 00 .....
                                6
0030 10 0F 46 07 91 C9 D5 E3 D7 E4 06 92 01 73 17 41 ....jINTPU.k....
                                8
                                9
                                10
0040 0E 51 01 00 00 00 00 00 00 00 00 00 00 1A 60 .....-
0050 EE 4B 7A FF 1F E7 A4 F8 0F E4 E2 C9 C2 D4 D9 C1 :...Xu8.USIBMRA
0060 4B C3 D7 F3 F1 F7 F4 F1 08 81 02 06 01 73 17 41 .CP31741.a.....
- - - - - Frame 5 - - - - -
0000 C4 DC 2F 00 02 01 00 00 83 01 00 00 00 07 D.....c.....
- - - - - Frame 6 - - - - -
0000 C4 DE 2C 00 01 01 13 1E 0B 90 81 11 05 02 FF 00 D.....a.....
                                11
0010 03 D0 00 00 04 22 F0 F0 F3 00 00 00 00 58 12 C4 .}....003.....D
                                12
0020 89 00 00 00 02 16 60 F8 6F E1 64 A8 3F F1 68 0B i.....-8?.y.1..
                                13
0030 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 06 81 00 01 00 USIBMRA.RAI.a...
0040 20 07 82 08 00 00 00 00 2C 2B 03 03 13 0E F4 E4 ..b.....4U
                                12
0050 E2 C9 C2 D4 D9 C1 4B D9 C1 D3 E8 C1 E2 F4 C2 0B SIBMRA.RALYAS4B.
0060 0E F4 D9 C1 D3 E8 C1 E2 F4 C1 0A 0E F4 C3 D7 F3 .4RALYAS4A..4CP3
0070 F1 F7 F4 F1 00 34 12 CA 05 80 80 04 80 0F 3D 00 1741.....
                                14
                                15
0080 F6 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 09 3E 07 80 6USIBMRA.RAI....
0090 80 FF FF FF FF 13 82 00 F3 E4 E2 C9 C2 D4 D9 C1 .....b.3USIBMRA
                                16
00A0 4B C3 D7 F3 F1 F7 F4 F1 00 69 12 C5 00 04 05 80 .CP31741...E....
                                17
00B0 00 00 08 C3 D7 E2 E5 D9 D4 C7 D9 00 00 29 19 0A ...CPSVRMGR....
00C0 C4 00 08 E4 E2 C9 C2 D4 D9 C1 40 08 C3 D7 F3 F1 D..USIBMRA .CP31
00D0 F7 F4 F1 40 08 E4 E2 C9 C2 D4 D9 C1 40 08 C3 D7 741 .USIBMRA .CP
00E0 F3 F1 F7 F4 F1 40 19 19 00 20 00 08 E4 E2 C9 C2 31741 .....USIB
00F0 D4 D9 C1 40 08 D9 C1 C9 40 40 40 40 40 00 00 0C MRA .RAI ....
0100 2C 07 08 E2 D5 C1 E2 E5 C3 D4 C7 06 5D 04 81 00 ...SNASVCMG.)a.
0110 00 .

```

Figure 521 (Part 1 of 4). Trace of DLUR/S Flows

```

- - - - - Frame 7 - - - - -
0000 C4 1C 2E 00 00 02 12 79 0B 91 81 11 05 02 FF 00 D.....ja....
0010 03 D0 00 00 04 22 F0 F0 F3 00 00 00 00 2C 12 C4 .}....003.....D
0020 41 00 00 00 02 16 60 F8 6F E1 64 A8 3F F1 68 0B .....-8?..y.1..
      18
0030 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 06 81 00 01 00 USIBMRA.RAI.a...
0040 20 07 82 08 00 00 00 00 00 2E 12 CB 04 80 80 00 ..b.....
      19
0050 13 3C 00 F6 E4 E2 C9 C2 D4 D9 C1 4B C3 D7 F3 F1 ...6USIBMRA.CP31
      20
0060 F7 F4 F1 13 3D 00 F3 E4 E2 C9 C2 D4 D9 C1 4B C3 741...3USIBMRA.C
0070 D7 F3 F1 F7 F4 F1 00 69 12 C5 00 04 05 80 00 00 P31741...E.....
0080 08 C3 D7 E2 E5 D9 D4 C7 D9 00 00 29 19 0A C4 00 .CPSVRMGR.....D.
0090 08 E4 E2 C9 C2 D4 D9 C1 40 08 C3 D7 F3 F1 F7 F4 .USIBMRA .CP3174
00A0 F1 40 08 E4 E2 C9 C2 D4 D9 C1 40 08 C3 D7 F3 F1 1 .USIBMRA .CP31
00B0 F7 F4 F1 40 19 19 00 20 00 08 E4 E2 C9 C2 D4 D9 741 .....USIBMR
00C0 C1 40 08 D9 C1 C9 40 40 40 40 40 00 00 0C 2C 07 A .RAI .....
00D0 08 E2 D5 C1 E2 E5 C3 D4 C7 06 5D 04 81 00 00 .SNASVCMG.)a..
- - - - - Frame 8 - - - - -
0000 C4 F0 2F 00 02 00 00 00 83 01 00 00 00 06 D0.....c.....
- - - - - Frame 9 - - - - -
0000 C4 F2 2D 00 02 01 11 5D 6B 81 00 31 00 13 07 B0 D2.....),a.....
      21 21
0010 B0 50 B3 3F 87 97 97 87 3F 06 02 00 00 00 00 00 .&..gppg.....
0020 00 00 00 23 00 00 0B E4 E2 C9 C2 D4 D9 C1 4B D9 .....USIBMRA.R
0030 C1 C9 22 00 09 02 C3 D7 E2 E5 D9 D4 C7 D9 09 03 AI....CPSVRMGR..
      22
0040 00 6F E1 64 A8 3F F1 68 0C 04 E4 E2 C9 C2 D4 D9 .?.y.1...USIBMR
0050 C1 4B D9 C1 C9 00 0F E4 E2 C9 C2 D4 D9 C1 4B C3 A.RAI..USIBMRA.C
0060 D7 F3 F1 F7 F4 F1 60 14 F8 6F E1 64 A8 3F F1 68 P31741-.8?..y.1.
0070 0B E4 E2 C9 C2 D4 D9 C1 4B D9 C1 C9 2B 3A 03 03 .USIBMRA.RAI....
0080 1B 46 19 80 01 10 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 .....USIBMRA.RA
0090 D3 E8 C1 E2 F4 C2 00 80 00 00 18 0F 46 0D 80 15 LYAS4B.....
00A0 08 D9 C1 D3 E8 C1 E2 F4 C1 00 0E 46 0C 80 15 07 .RALYAS4A.....
00B0 C3 D7 F3 F1 F7 F4 F1 00 2C 0A 07 08 E2 D5 C1 E2 CP31741....SNAS
      23
00C0 E5 C3 D4 C7 VCMG
- - - - - Frame 10 - - - - -
0000 C4 5E 2D 00 01 02 11 5D EB 80 00 31 00 13 07 B0 D;.....).....
      24 24
0010 B0 50 B3 00 80 86 86 80 00 06 02 00 00 00 00 00 .&...ff.....
0020 00 00 00 23 00 00 00 26 00 09 02 C3 D7 E2 E5 D9 .....CPSVR
0030 D4 C7 D9 09 03 F0 6F E1 64 A8 3F F1 68 10 05 E4 MGR..0?.y.1...U
0040 E2 C9 C2 D4 D9 C1 4B C3 D7 F3 F1 F7 F4 F1 00 00 SIBMRA.CP31741..
0050 60 14 F8 6F E1 64 A8 3F F1 68 0B E4 E2 C9 C2 D4 -.8?..y.1..USIBM
0060 D9 C1 4B D9 C1 C9 2B 3A 03 03 1B 46 19 80 01 10 RA.RAI.....
0070 E4 E2 C9 C2 D4 D9 C1 4B D9 C1 D3 E8 C1 E2 F4 C2 USIBMRA.RALYAS4B
0080 00 80 00 00 18 0F 46 0D 80 15 08 D9 C1 D3 E8 C1 .....RALYA
0090 E2 F4 C1 00 0E 46 0C 80 15 07 C3 D7 F3 F1 F7 F4 S4A.....CP3174
00A0 F1 00 1.
- - - - - Frame 11 - - - - -
0000 C4 50 2D 00 01 00 00 00 83 01 00 00 00 01 D&.....c.....
- - - - - Frame 12 - - - - -
0000 C4 34 2C 00 02 01 00 01 0B 95 01 0E 05 02 FF 00 D.....n.....
0010 03 D0 00 00 04 22 F0 F0 F6 00 3A 15 00 00 0E 2C .}....006.....
0020 00 00 00 00 8B 80 00 41 02 3E 1A 60 EE 4B 7A .....-:
      25 25
0030 FF 1F E7 A4 F8 0F E4 E2 C9 C2 D4 D9 C1 4B C3 D7 ..Xu8.USIBMRA.CP
0040 F3 F1 F7 F4 F1 0E 51 01 00 01 00 00 00 80 00 31741.....
0050 00 00 00 ...
- - - - - Frame 13 - - - - -
0000 C4 72 2D 00 01 02 00 00 83 01 00 00 00 01 D.....C.....
- - - - - Frame 14 - - - - -
0000 C4 56 2C 00 02 01 00 02 0B 95 81 0E 05 02 FF 00 D.....na.....
0010 03 D0 00 00 04 22 F0 F0 F6 00 67 15 00 00 27 2D .}....006.....
0020 00 00 00 11 5C 6B 80 00 11 02 01 05 00 00 00 00 ....*,.....
      26 26
0030 12 0E 11 F1 E4 E2 C9 C2 D4 D9 C1 4B E2 E6 F3 F1 ...1USIBMRA.SW31
      27
0040 F7 F4 F1 D7 13 43 02 00 07 07 00 00 00 02 09 00 741P.....
0050 00 00 00 00 01 00 0F 46 07 91 C9 D5 E3 D7 E4 .....jINTPU
      28
0060 06 92 01 73 17 41 1A 60 EE 4B 7A FF 1F E7 A4 F8 .k.....-:..Xu8
      28
0070 0F E4 E2 C9 C2 D4 D9 C1 4B C3 D7 F3 F1 F7 F4 F1 .USIBMRA.CP31741
- - - - - Frame 15 - - - - -
0000 C4 84 2D 00 01 02 00 00 83 01 00 00 00 01 Dd.....c.....

```

Figure 521 (Part 2 of 4). Trace of DLUR/S Flows

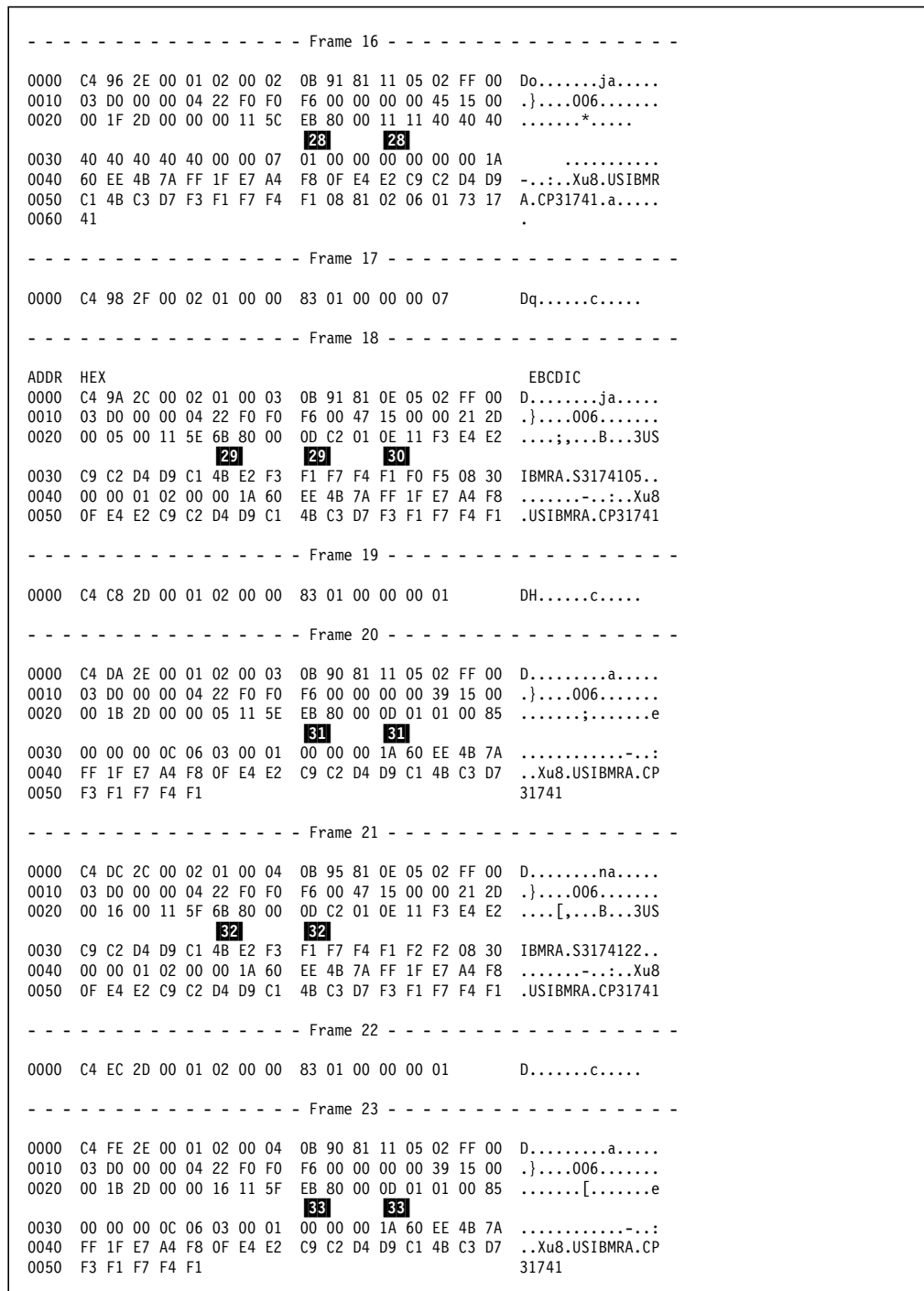


Figure 521 (Part 3 of 4). Trace of DLUR/S Flows

```

- - - - - Frame 24 - - - - -
0000 C4 DE 2C 00 02 01 00 0C 0A 95 80 0E 05 02 FF 00 D.....n.....
0010 03 D0 00 00 04 22 F0 F0 F6 02 60 15 00 02 42 2C .)....006.-.....
0020 00 05 00 00 01 03 00 00 40 15 D4 E2 C7 F1 F0 40 .....MSG10
0030 E2 D5 C1 15 40 15 C9 D5 E3 C5 D9 D5 C1 E3 C9 D6 SNA. .INTERNATIO
0040 D5 C1 D3 40 E3 C5 C3 C8 D5 C9 C3 C1 D3 40 E2 E4 NAL TECHNICAL SU
0050 D7 D7 D6 D9 E3 40 C3 C5 D5 E3 C5 D9 40 15 C6 96 PPORT CENTER .Fo
0060 99 40 93 96 87 96 95 40 83 96 94 94 81 95 84 40 r logon command
0070 A2 A8 95 A3 81 A7 6B 40 97 99 85 A2 A2 40 85 95 syntax, press en
0080 A3 85 99 40 15 40 15 40 15 40 15 40 40 15 40 5C ter. . . . *
0090 5C 5C 5C 5C 5C 40 40 40 40 40 5C 5C 5C 5C 5C 40 *****
00A0 40 40 40 40 40 5C 5C 5C 5C 5C 40 40 40 40 40 5C ***** *
00B0 5C 5C 5C 5C 5C 40 15 5C 5C 40 40 40 40 40 5C 40 ***** ** *
00C0 40 40 5C 5C 40 40 40 5C 5C 40 40 40 40 5C 40 40 ** ** *
00D0 40 5C 5C 40 40 40 40 5C 5C 40 40 40 40 5C 5C 40 ** ** **
00E0 15 5C 5C 40 40 40 40 40 40 40 40 40 5C 5C 40 40 . ** **
00F0 40 5C 5C 40 40 40 40 40 40 40 40 5C 5C 40 40 40 ** **
0100 40 5C 5C 40 40 40 40 5C 5C 40 15 40 40 5C 5C 5C ** ** , ***
0110 5C 5C 40 40 40 40 5C 5C 5C 5C 5C 5C 40 40 40 ** *****
0120 40 40 40 40 40 5C 5C 40 40 40 40 40 5C 5C 5C 5C ** ** ****
0130 5C 5C 40 40 15 40 40 40 40 40 40 40 5C 5C 40 40 ** . **
0140 5C 5C 40 40 40 5C 5C 40 40 40 40 40 40 40 40 5C * ** ** *
0150 5C 40 40 40 40 5C 5C 40 40 40 5C 5C 40 15 40 * ** ** .
0160 40 40 40 40 40 40 5C 5C 40 40 5C 5C 40 40 40 5C ** ** *
0170 5C 40 40 40 40 40 40 40 40 5C 5C 40 40 40 40 5C * ** ** *
0180 5C 40 40 40 40 5C 5C 40 15 40 5C 5C 5C 5C 5C 5C * ** , *****
0190 40 40 40 40 5C 5C 40 40 40 5C 5C 40 40 40 40 40 ** **
01A0 5C 5C 5C 5C 5C 5C 5C 40 40 40 5C 5C 5C 5C 5C 5C *****
01B0 40 15 40 40 15 40 40 40 40 40 40 40 5C 5C 40 40 . . **
01C0 5C 5C 40 40 5C 40 40 40 5C 40 40 5C 5C 5C 40 15 ** * * ***
01D0 40 40 40 40 40 40 40 5C 40 5C 5C 40 5C 40 40 5C * ** * *
01E0 40 40 40 5C 40 5C 40 15 40 40 40 40 40 40 40 5C * * . *
01F0 40 40 40 40 5C 40 40 40 5C 40 5C 40 40 40 5C 5C * * * **
0200 5C 40 40 40 40 40 40 C9 E3 E2 C3 * ITSC

- - - - - Frame 25 - - - - -
0000 C4 1C 2D 00 01 02 00 00 83 01 00 00 00 01 D.....c.....

- - - - - Frame 26 - - - - -
0000 C4 F0 2C 00 02 01 00 0D 01 95 01 F1 F8 40 15 40 D0.....n.18 .
0010 40 40 40 40 40 40 5C 40 40 40 40 5C 40 40 40 5C * * *
0020 5C 5C 40 40 40 40 40 40 5C 40 40 40 40 40 E2 C1 ** * SA
0030 F1 F8 40 15 40 40 40 40 40 40 40 5C 40 40 40 40 18 . *
0040 5C 40 40 40 40 5C 40 40 40 40 5C 5C 5C 40 40 40 * * ***
0050 40 40 40 E2 F3 F1 F7 F4 F1 F0 F5 40 15 40 15 1A S3174105 . .
0060 60 EE 4B 7A FF 1F E7 A4 F8 0F E4 E2 C9 C2 D4 D9 -. . . . Xu8. USIBMR
0070 C1 4B C3 D7 F3 F1 F7 F4 F1 A. CP31741

- - - - - Frame 27 - - - - -
0000 C4 2E 2D 00 01 02 00 00 83 01 00 00 00 01 D.....c.....

```

Figure 521 (Part 4 of 4). Trace of DLUR/S Flows

Frame and Description Table

Table 19 (Page 1 of 2). Frame and Description Table	
Frame Number	Description
Frame 1	BIND Request This frame shows the DLUR CP31741 establishes its CONWINNER session to the DLUS RAI with a BIND 1 specifying the mode CPSVRMGR 2 with an associated COS SNASVCMG 3. This also gives the routing information for this session flow via the RSCV X'2B" vector. 4
Frame 2	Isolated Pacing Message (IPM)
Frame 3	Bind Response This shows the positive BIND response 5 from RAI. This establishes a CPSVRMGR session with CP31741 as the primary LU and RAI as the secondary LU.
Frame 4	Encapsulated REQACTPU With the CPSVRMGR session established, this frame shows CP31741 sending an encapsulated REQACTPU 6 to RAI in the GDS variable X'1500' 7. CP31741 identifies the PU through the appended CV 46 8 with subvector SV 91 9 that contains identifier 'INTPU' and subvector 92 10 which contains the DLC addressing information in the form of IDBLK/IDNUM.
Frame 5	Isolated Pacing Message (IPM)
Frame 6	Locate Search Request This frame shows an attach FMH-5 11 with a locate search request from RAI. This frame contains three different GDS variables namely: • X'12C4' which shows the routing information for this session through the X'2B' 12 vector and tells whether this locate search is a request or a reply through byte 4, 13 (bits 1 to 3 = X'000' is a request). • X'12CA' 14 which provides the search origin via X'3D' 15 vector (USIBMRA.RAI) and the search argument via X'82' 16 vector which in this case is USIBMRA.CP31741. • X'12C5' 17 which contains that RAI is the primary LU and the modename to be used is CPSVRMGR.
Frame 7	Locate Search Reply This is a Locate search reply as indicated in GDS variable X'12C4' byte 4 (bits 1 to 3 =X'100') 18. The absence of an X'35' vector implies no error in the locate. The GDS variable X'12CB' 19 indicates that LU is found. Vectors X'3C' 20 identifies the NN CP317431 for the located LU CP31741
Frame 8	Isolated Pacing Message (IPM)
Frame 9	Bind Request With the required LU successfully located, RAI is now ready to establish its own CONWINNER session. This frame shows the BIND request 21 from RAI to CP31741 with mode CPSVRMGR 22 and COS SNASVCMG. 23 This also shows the routing information for this BIND.
Frame 10	Bind Response This frame shows the positive BIND response 24 from CP31741 to RAI. This establishes another CPSVRMGR session where RAI as the primary LU and CP31741 as the secondary LU. The pipe is now established.
Frame 11	Isolated Pacing Message (IPM)

Table 19 (Page 2 of 2). Frame and Description Table

Frame Number	Description
Frame 12	Encapsulated REQACTPU Reply Using the newly established CPSVRMGR session, RAI sends an encapsulated REQACTPU positive response 25 to the pending encapsulated REQACTPU request received earlier from CP31741 via GDS variable X'1500'.
Frame 13	Isolated Pacing Message (IPM)
Frame 14	Encapsulated ACTPU Request This frame shows now the encapsulated ACTPU request 26 with related informations such as the PU name USIBMRA.SW31741P 27 and subvectors 91 and 92.
Frame 15	Isolated Pacing Message (IPM)
Frame 16	Encapsulated ACTPU Response This frame shows the encapsulated ACTPU positive response 28 from CP31741. This now establishes the SSCP-PU session and PU CP3174P's status to VTAM gets ACTIVE.
Frame 17	Isolated Pacing Message (IPM)
Frame 18	Encapsulated ACTLU Request With the PU active, RAI now sends the encapsulated ACTLU request 29 to CP31741 identifying LU USIBMRA.S3174105. 30
Frame 19	Isolated Pacing Message (IPM)
Frame 20	Encapsulated ACTLU Response This frame shows the encapsulated ACTLU response 31 from CP31741 to RAI. This establishes the SSCP-LU session between RAI and S3174105.
Frame 21	Encapsulated ACTLU Request This frame shows the encapsulated ACTLU request 32 for LU S3174122.
Frame 22	Isolated Pacing Message (IPM)
Frame 23	Encapsulated ACTLU Response The encapsulated ACTLU response 33 establishing the SSCP-LU session between RAI and S3174122.
Frame 24	Encapsulated MSG 10. This frame shows VTAM sending the MSG 10 panel allowing the LU to initiate an LU-LU session.
Frame 25	Isolated Pacing Message (IPM)
Frame 26	Encapsulated MSG 10. This frame contains the continuation of the MSG 10 screen.
Frame 27	Isolated Pacing Message (IPM)

F.3 AS/400 and 3174 Border Node Exchange Traces

The trace shown below is taken from RALYAS4A. Specifying Format SNA Data only as N gives the DLC XIDs and SABME. In the S/R column, a value of S means that the trace entry flows from the AS/400 towards the 3174. Table 20 on page 491 trace shows trace entries and the corresponding analysis.

COMMUNICATIONS TRACE										Title:		07/05/94 10:09:44		Page: 3	
Record Number	S/R	Data Length	Record Timer	Data Type	Controller Name	Destination MAC Address	Source MAC Address	Frame Format	Command	Number Sent	Number Received	Poll/Final	DSAP	SSAP	
182	S	0	5214.5	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	XID			ON	04	04	
Routing Information : 0270															
183	R	0	5214.5	EBCDIC	CTL3174C3	400010020001	400031740003	LLC	XID			ON	04	05	
184	S	80	5214.5	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	XID			ON	04	04	
Routing Information : 0270															
Data . . . : 3250056150780000800A0800000000001010B700007CA0000000007000E										*.&./&.....*					
11F4E4E2C9C2D4D9C14BD9C1D3E8C1E2F4C11017F1161101130011F9F4F0										*.4USIBMRA.RALYAS4A..1.....940*					
F6C5F5F0F1F0F0F0F1F5F0F7F846050580000004										*6E50100015078.....*					
185	R	83	5214.6	EBCDIC	CTL3174C3	400010020001	400031740003	LLC	XID			ON	04	05	
Data . . . : 325301700000000080C3000000008001010B710010090000000001000E										*.....C.....*					
10F4E4E2C9C2D4D9C24BC3D7F3F1F7F4F30E09F7D3C9D5D2F3F0F0C11017										*.4USIBMRB.CP31743..7LINK300A..*					
F1161101130012F3F1F7F4F1F3D9F0F0F0F0F0F0F0F0										*1.....317413R0000000000*					
186	S	80	5214.6	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	XID			ON	04	04	
Routing Information : 0270															
Data . . . : 325005615078000080FAC8000000008001010B700007CA0000000007000E										*.&./&.....H.....*					
11F4E4E2C9C2D4D9C14BD9C1D3E8C1E2F4C11017F1161101130011F9F4F0										*.4USIBMRA.RALYAS4A..1.....940*					
F6C5F5F0F1F0F0F0F1F5F0F7F846050580010004										*6E50100015078.....*					
187	R	83	5214.6	EBCDIC	CTL3174C3	400010020001	400031740003	LLC	XID			ON	04	05	
Data . . . : 32530000B95D000080F6C3000000008001010B710010090000000001000E										*.....).6C.....*					
10F4E4E2C9C2D4D9C24BC3D7F3F1F7F4F30E09F7D3C9D5D2F3F0F0C11017										*.4USIBMRB.CP31743..7LINK300A..*					
F1161101130012F3F1F7F4F1F3D9F0F0F0F0F0F0F0F0										*1.....317413R0000000000*					
188	S	80	5214.6	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	XID			ON	04	04	
Routing Information : 0270															
Data . . . : 325005615078000080B6C8000000008001010B700007CA0000000007000E										*.&./&.....H.....*					
11F4E4E2C9C2D4D9C14BD9C1D3E8C1E2F4C11017F1161101130011F9F4F0										*.4USIBMRA.RALYAS4A..1.....940*					
F6C5F5F0F1F0F0F0F1F5F0F7F846050580010004										*6E50100015078.....*					
189	R	83	5214.6	EBCDIC	CTL3174C3	400010020001	400031740003	LLC	XID			ON	04	05	
Data . . . : 325301700000000080F6C3000000008001010B410010090000000001000E										*.....).6C.....*					
10F4E4E2C9C2D4D9C24BC3D7F3F1F7F4F30E09F7D3C9D5D2F3F0F0C11017										*.4USIBMRB.CP31743..7LINK300A..*					
F1161101130012F3F1F7F4F1F3D9F0F0F0F0F0F0F0F0										*1.....317413R0000000000*					
190	S	80	5214.6	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	XID			ON	04	04	
Routing Information : 0270															
Data . . . : 325005615078000080B6C8000000008000010B500007CA0000000007000E										*.&./&.....H.....&.....*					
11F4E4E2C9C2D4D9C14BD9C1D3E8C1E2F4C11017F1161101130011F9F4F0										*.4USIBMRA.RALYAS4A..1.....940*					
F6C5F5F0F1F0F0F0F1F5F0F7F846050580010004										*6E50100015078.....*					
191	R	83	5214.6	EBCDIC	CTL3174C3	400010020001	400031740003	LLC	XID			ON	04	05	
Data . . . : 325301700000000080F6C3000000008001010B410010090000000001000E										*.....).6C.....*					
10F4E4E2C9C2D4D9C24BC3D7F3F1F7F4F30E09F7D3C9D5D2F3F0F0C11017										*.4USIBMRB.CP31743..7LINK300A..*					
F1161101130012F3F1F7F4F1F3D9F0F0F0F0F0F0F0F0										*1.....317413R0000000000*					
192	S	0	5214.6	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	SABME			ON	04	04	
Routing Information : 0270															
193	R	0	5214.6	EBCDIC	CTL3174C3	400010020001	C00031740003	LLC	UA			ON	04	05	
Routing Information : 02F0															
196	R	146	5214.6	EBCDIC	CTL3174C3	400010020001	C00031740003	LLC	I	0	0	OFF	04	04	
Routing Information : 02F0															
Data . . . : 2F00000200036B810031001307B0B050B3078787870706020000000000										*.....,A.....&..GGGG.....*					
00000023000000FE4E2C9C2D4D9C24BC3D7F3F1F7F4F325000802C3D7E2E5										*.....USIBMRB.CP31743....CPSV*					
C3D4C7090301000000000000031004E4E2C9C2D4D9C24BC3D7F3F1F7F4F3										*CMG.....USIBMRB.CP31743*					
0010E4E2C9C2D4D9C14BD9C1D3E8C1E2F4C16018EE4B7CFF0000000020FE4										*..USIBMRA.RALYAS4A-...@.....U*					
E2C9C2D4D9C24BC3D7F3F1F7F4F32C0A0408C3D7E2E5C3D4C700										*SIBMRB.CP31743....CPSVCMG..*					
198	S	12	5214.6	EBCDIC	CTL3174C3	400031740003	C00010020001	LLC	I	0	1	OFF	04	04	
Routing Information : 0270															
Data . . . : 2D0000010000830100000001										*.....C.....*					

Figure 522 (Part 1 of 2). Border Node Trace Entries Between RALYAS4A and CP31743

Figure 522 (Part 2 of 2). Border Node Trace Entries Between RALYAS4A and CP31743

<i>Table 20. Trace Table Entries and Analysis</i>	
Frame Number	Description and Analysis
Frames 182 and 183	These are the “null XIDs” used to identify that the nodes exist, and are capable of an XID exchange.
Frames 184 to 186	These are XID3 exchanges that shows the prenegotiations with regards to their CP capabilities. Bit 9 on byte 8 on frames 185 and 186 has a value of X’1’, which means that the 3174 and the AS/400 are NNs.
Frame 187 to 190	These are “negotiation proceeding” XIDs. Notice that on frame 188 byte 8, bit 9 has changed to a value of X’0’, which shows that the AS/400 is not a NN.
Frames 192 and 193	These are the SABME and UA being exchanged, indicating that the two nodes are ready to continue to communicate at higher levels of APPN.
Frames 196 to 276	These show the BIND requests and responses for the two CP-CP session establishments. With a successful CP-CP activation, the two nodes are now able to send each other about relevant APPN information. Frame ordering in the trace may not be easy to follow as there are two sessions established. Frame 196 shows a bind request from the 3174. Instead of sending a positive BIND response, frame 272 shows another BIND request was initiated by the AS/400. Frames 276 and 278 later shows the respective BIND responses for the two requests. Frame 198 is a pacing message that indicates the number of requests that may be sent to the AS/400 at a time and sometimes referred to as the window size.
Frame 278	This frame shows an RU that contains a Function Management Header type 5. The FMH-5 carries an LU 6.2 ATTACH and points to an application name of X’22F0F0F1’. This indicates that the 3174 is requesting the CP capabilities of the AS/400. This frame also has the GDS variable X’12C1’ which shows the capability of the 3174 as NN as byte 8 is set to X’111’ (X’F’).
Frame 280	This frame is another FMH-5 with an LU 6.2 ATTACH and shows a GDS variable X’12C1’. With a value of X’100’ (X’8) set to byte 8, the AS/400 acts as an EN.

List of Abbreviations

ABBREVIATION	MEANING		
AEA	asynchronous emulation adapter	NCP	network control program
APA	all points addressable	NETID	network identifier or network name
APPC	advanced program-to-program communication	NCCF	network communication control facility
APPN	advanced peer-to-peer networking	NLDM	networking logical data manager
CN	connection network	NMVT	network management vector transport
CNOS	change number of sessions	NN	network node
COS	class of service	NS/2	Networking Services/2
CP	control point	NTRI	NCP token-ring interconnection
CPNAME	control point name	OLU	origin logical unit
DCAF	Distributed Console Access Facility	PC/3270	Personal Communications/3270
DLC	data link control	PLU	partner LU
DLU	destination logical unit	PTF	program temporary fix
DSAP	destination service access point	PU	physical unit
DSL	downstream load	RAR	route addition resistance
DSPU	downstream PU	RPQ	request for price quotation
DYNLU	dynamic LU	RSCV	route selection control vector
EN	end node	RU	request unit
FQPCID	fully-qualified procedure correlation identifier	SABME	set asynchronous balanced mode extended
GDS	generalized data stream	SAP	service access point
ISDN	integrated services digital network	SATF	shared-access transport facility
ISL	initial session limit	SC	status code
ITSC	International Technical Support Center	SDLC	synchronous data link control
KB	kilobyte	SLMH	single link multiple host
LAN	local area network	SNA	systems network architecture
LEN	low entry networking	SSAP	source service access point
LIC	licensed internal code	SSCP	systems services control point
LTLW	LAN-to-LAN Wide Area Network Program	TG	transmission group
LU	logical unit	TDU	topology database update
LUNAME	logical unit name	TIC	token-ring interface coupler
MAC	medium access control	TP	transaction program
MB	megabyte	TRN	token-ring network
NAU	network addressable unit	TRS	topology routing services
		T2.0	type 2.0
		T2.1	type 2.1

<i>UA</i>	unnumbered acknowledgement	<i>WPCSP</i>	3174 Workstation Peer Communication Support Program
<i>VN</i>	virtual node	<i>WSF</i>	5250 Work Station Feature
<i>VTAM</i>	virtual telecommunications access method	<i>XID</i>	exchange identification
<i>WAN</i>	wide area network		
<i>WC</i>	wildcard		

Index

Special Characters

*ANY Routing for AS/400 18
#BATCH 461
#BATCHSC 463
#CONNECT 467
#INTER 464
#INTERSC 466

Numerics

256 Kbps 2
3174 APPN Implementation
 appn and appc 433
 APPN and Peer combined 66
 Configuration Support-C Release 1 5
 Configuration Support-C Release 3 4
 Configuration Support-C Release 4 3
 Configuration Support-C Release 5 2
 Configuration Support-C Release 6 1
 mode name and cos 111
 RPQ 8Q1041 (TCP Enhancements) 4
 shared link support 110
 subarea VTAM/NCP levels 112
 t2.1 links 109
3174 AS/400s GW definitions 175
3174 central site 389
3174 Establishment Controller Configuration
 Support-C Release 5 Licensed Internal Code
 (LIC) 2
3174 Gateway and APPN definitions 170
3174 GW definitions 171
3174 GW Frame size 168
3174 GW link consideration 168
3174 GW Mode consideration 168
3174 GW Operation View from the 3174 179
3174 GW Operation View from the AS/400 180
3174 GW Pacing values 168
3174 GW Patch #AD2F 168
3174 GW RU size 168
3174 GW scenario. Important considerations. 168
3174 GW Verification View from VTAM/NetView 177
3174 GW VTAM definitions 169
3174 in Frame Relay 2
3174 network node services 14
3174 network site 389
3174 NN with VTAM APPN Nodes (Token-Ring)
 3174 APPN definitions 123
 adjacent resources 124
 associated LUs 124
 defining resources 123
 enabling APPN 123
 local resources 123
 Activation and Verification 125
 3174 128
 NetView 125

3174 NN with VTAM APPN Nodes (Token-Ring)
 (continued)
 definition overview 120
 start options 122
 VTAM and NCP definitions 120
 3174 switched major node 120
 host applications 121
 network node server list 121
3174 utility microcode (FUNCTEC) 416
3174 via Shared SDLC LINK to an AS/400
 11rs02 common sna 184
 3174-11R customization 141
 adjacent nodes 165
 appn node definition 144
 associated lu 145
 Associated LUs 145
 common network 143
 common sna 142
 control point name 142
 defining DSPU address limit 142
 defining mode/cos correlation 145
 defining network ID 142
 defining RU size 142
 defining SDLC address 142
 disabled wildcard 144
 display adjacent nodes 165
 enabling APPN 142
 enabling token-ring gateway 142
 mode/cos 145
 model attach 141
 network resources 144
 ring address assignment 143
 sdlc 142
 token-ring address 143
AS/400 definitions 132
 configuration status 165, 166
 controller description ctl3174c3m 134
 controller description ctldoscoax2 137
 controller description ctllps2encm 138
 controller description lin3174c3 134
 controller description ra9p05 139
 defining control point name 132
 defining local LU name 132
 defining network name 132
 defining node type 132
 device description cp317400 137
 device description dev3174c3 135
 device description dev3174c33 135
 device description devdoscoax2 138
 device description devps2encm 138
 device description doscoax2 136
 device description for CP3174 Dependent
 LUs 135
 device description ps2encm 136
 device description ra9t0506 140

3174 via Shared SDLC LINK to an AS/400 *(continued)*

AS/400 definitions *(continued)*

- device description ra9t0507 140
- line description lin3174c3 133
- line description ra9l005 139
- network attributes 132

Communications Manager/2 definition 148

- 3270 emulation 154
- 3270 emulation through token-ring 149
- 3270 logical terminal 155
- 5250 emulation 156
- adapter list 153, 158
- change a connection to a network node 153, 158
- configuration definition 149, 156
- connection list 152
- connections list 157
- Installation and Setup 148
- local node characteristics 151
- profile list sheet 150, 151, 152, 154, 157
- psen3174.ndf file 159
- TR or other LAN types dlc adapter parameters 150

control point name 184

defining network ID 184

Definition Overview 130

enabling APPN 184

LAPS 146

- configure workstation 146
- lan adapter and protocol support (config.sys) 147
- network adapter address 146

PC Support/400 Configuration 163

- completion config.pcs file 163
- config.pcs file 163
- pc support/400 configuration 163
- pc to as/400 connect ion 163
- pc to as/400 connection 163

personal communication 161

- customize communication 161
- customize communication - 3270 host 162
- ieee 802.2 162

RUMBA/400 164

- session connection 164
- session information 164

verification and activation 165

VTAM and NCP definitions 131

- NCP line and PU to AS/400 131

3174-11L customization

- 11ls00 model attach 182
- 11ls01 local 183
- 11ls03 common network 184
- 11ls04 ring address assignment 185
- 11rs06 network resources 185
- defining DSPU address limit 183
- defining local address 183
- defining RU size 183

3174-11L customization *(continued)*

- enabling token-ring gateway 183

- network resources 185

- ring address assignment 185

- token-ring address 184

3270 Device Status 50

3270 Host Status Summary 51

A

abbreviations 493

Acquiring BACKUP Focal Point 47

acronyms 493

ACTPU Suppression 31, 38

Address Space Manager 11, 12

Adjacent Link Station name control vector 38

Advanced Peer-to-Peer Networking LIC feature 3

APPN 1

APPN Connectivity

APPN Node Definition panel 21

APPN over Channel

APPN over ESCON

APPN over Frame Relay 3

APPN over LAN

APPN over SDLC

APPN over X.21

APPN over X.25 3

APPN Overview

- benefits 433

- introduction 431

- terminology 434

APPN support 413, 415

APPN Tests 52

AS/400 46

AS/400 Connected to VTAM via a 3174 GW

- 3174 GW AS/400s definitions 175

- 3174 GW definitions 171

- 3174 GW Frame size 168

- 3174 GW link consideration 168

- 3174 GW Mode consideration 168

- 3174 GW Operation View from the 3174 179

- 3174 GW Operation View from the AS/400 180

- 3174 GW Pacing values 168

- 3174 GW RU size 168

- 3174 GW Verification View from

- VTAM/NetView 177

- 3174 GW VTAM definitions 169

- Patch #AD2F 168

AS/400 considerations

AS/400 running SPLS connected to VTAM via a 3174 GW 168

- 3174 Gateway and APPN definitions 170

- AS400 A definitions 175

- AS400 B definitions 176

- Important considerations. 168

- VTAM Definitions for AS/400 A 170

- VTAM Definitions for AS/400 B 170

AS400 A definitions 175

AS400 B definitions 176

B

BIND 447
Border Node
 AS/400 multi-network connectivity 115
Border node function 42
Border Node interoperability 3
Border node interoperability (coexistence) 42
border node support 42
boundary attachment 45
boundary-attached 13, 17, 19
boundary-attached network node 23
broadcast search request 30

C

CC Client
 local 407
CC Server
 remote 407
CDM commands
CDM dialogs
 Base and Server Feature Installation window 406
 New Node window 411
Central Directory 13
Central Directory Client 13, 46
Central Directory Client Support 3
central directory requester 14
Central Directory Server (CDS) 46
Central Site Control Facility 110
change management
 in the scenario: remote administrator workstation
 and 3174 establishment controller 415
command (NetBIOS) 391
commands
Communications Manager/2
Config Support-C customization
Config Support-C diskette packaging
 control diskette 104
 control extension diskette 104
 DSL diskette 104
 utility diskette 104
Config Support-C3.0 Peer Communications (LAN over
coax) capabilities 4
Config Support-C4.0 APPN capabilities 2
Config Support-C4.0 Peer Communications (LAN over
coax) capabilities 4
Config Support-C5.0 Peer Communications (LAN over
coax) capabilities 3
Configuration Services 11, 12
Configuration Support-C Release 1 5
Configuration Support-C Release 1 base
capabilities 5
 peer communication 5
Configuration Support-C Release 2 5
Configuration Support-C Release 3 4

Configuration Support-C Release 4 3
Configuration Support-C1
Configuration Support-C2
Configuration Support-C3
Configuration Support-C3 base capabilities 4
Configuration Support-C4
Configuration Support-C4 base capabilities 4
Configuration Support-C5
Configuration Support-C5 base capabilities 2
Configuration Support-C6
connect phase 14
connection network
 benefits 48
Connection Networks 48
connection type 395
Connectivity Summary 10
considerations
 AS/400 115
 VTAM and NCP 107
contact phase 15
Control Point 11
 role of 432
Control Point-to-Control Point 11
control storage 12
Control Vector 46 45
COSTAB 112
CP capabilities 38
CP Capabilities Exchange 11, 12
CP name 394, 396
CP Name Change Support Indicator 38
CP-CP session support 38
CP-SVR (CPSVRMGR) pipe 44
CPNAME 15
CPNAME name change 15
CPSVRMGR 44
CSCM 13
 dependent LU 75
 independent LU 75
Customization
 3174-Peer Bridge Profile panel 95
 3174-Peer Definition panel 91
 APPN Node Definition panel 78
 Common SNA panel 75
 Customize Control Disk Menu 69
 defining associated LUs 84
 defining COS 88
 defining mode/COS correlation 90
 defining network resources 82
 LAN addressing 64
 LAN Manager profile 98
 LAN Manager Profile panel 99
 Local (SNA) panel 72
 Master Menu 69
 Model/Attach C3 70
 Model/Attach C4 C5 70
 overview panel flow for CS-C3 68
 Question 242: Link Type 72
 Question 500: CSCM Unique 75

Customization (*continued*)

- Question 501: Network ID 76
- Question 502: Logical Unit Name 75
- Question 510: APPN Network Controller 76
- Question 511: APPN Control Point Name 76
- Question 512: APPN Virtual Node Name 77
- Question 610 storage impact 102
- Question 610: APPN Sessions 79
- Question 611 storage impact 102
- Question 611: APPN Nodes/Links 79
- Question 612: APPN Wildcard Host Link 80, 81
- Question 612: APPN Wildcard Option 80
- Question 650 storage impact 102
- Question 650: 3174-Peer Support 91
- Question 651 storage impact 102
- Question 651: Bridge Support 92
- Question 652 storage impact 102
- Question 652: LAN Manager Support 92
- Question 653: 3174-Peer Online Test Updates 93
- Question 660: 3174-Peer Port Address Range 93
- Question 661: Percentage of Discard Threshold 94
- Question 670: Bridge Number 95
- Question 671: Token-Ring Segment Number 96
- Question 672: 3174-Peer Segment Number 96
- Question 673: Token-Ring Hop Count 96
- Question 674: Frame Forwarding Active 96
- Question 675: Bridge Performance Threshold 97
- Question 676: Logging Interval 97
- Question 677: Alert Interval 97
- Question 690: Reporting Link 0 Password 99
- Question 691: Reporting Link 1 Password 99
- Question 692: Reporting Link 2 Password 99
- Question 693: Reporting Link 3 Password 99
- X.25 APPN Nodes 85
- X.25 Circuit Profiles 99

customizing

- 3174 Establishment Network Controller C5 (central site) 412
- LAN Adapter and Protocol Support 390
- user profile management 390

D

- DDDLU
- deactivated 33
- Dependent LU Requester 3
- Dependent LU requester (DLUR) 14, 43
- Dependent LU Server
- Dependent LU Server (DLUS) 107
- Dependent LU SSCP Connectivity without Dependent LU Requester/Server 43
- Dependent LU(s)
 - Definition 447
- different NETID 42
- Directory Services 11, 12
- Display Active Locate Requests 55
- Display Adjacent Nodes 53
- Display Link Status 53

- Display Node Status 52
- Display Pending Session Route 54
- Display Pending Session Routes 54
- Display Session Status 54
- Distributed Console Access Facility
- DLUR Connectivity 50
- DLUR support for coax-attached 45
- DLUS/DLUR over a non-host link 45
- DLUS/DLUR pipe 44
- downgrade the link 32
- downgraded 31
- DSPUs 33
- DWNGRD 32
- Dynamic Homogenous Links 30
- Dynamic Homogenous T2.1 Links 33
- Dynamic shared link 14, 30, 33
- dynamically connect 33

E

- encapsulated ACTLU 45
- Encapsulated SSCP-PU and SSCP-LU 44
- End Node
 - functions provided by 431
- Entry Point 13
- Entry Point Function for 3174 Alerts 47
- Ethernet support 3
- EXPLICIT Focal Point Reporting 47
- Explicit Links 30, 32
- explicit response 22
- explicit responses 18
- extended border node 42

F

- Focal Point 13, 274
- FP LU name 408
- FP network ID 408
- FQPCID 55
- Frame Relay Communications LIC feature 1, 2
- Full Wildcard routing 18
- FUNCTEC 416
- Functions 6
 - APPN LIC feature 8
 - appn network node feature 11
 - connection network 48
 - directory services 12
 - functions supported 7
 - intermediate session routing 13
 - links supported 8
 - multiple link support 27
 - unsupported links 9
 - wildcard routing 18

G

- GDS variable X'1500' 44
- GDT selector keyword 391

generic naming

H

HAP printer assignment 4

Hardware and Software Requirements

hardware requirements

3174 models supported 101

APPN control storage 101

base control storage 101

deconfigure 103

diskette requirement 103

hard disk requirement 103

Peer control storage 102

Question 610 storage impact 102

Question 611 storage impact 102

Question 650 storage impact 102

Question 651 storage impact 102

Question 652 storage impact 102

storage worksheet 103

Host 112

host focal point

host to host channel connection 107

I

ILU - Independent Logical Unit 447

IMPLICIT Focal Point Reporting 47

independent local LU 396

Independent LU(s)

Definition 447

initiate the DLUS-DLUR pipe 45

INSTALL

installation

remote administrator workstation 406

Interchange node 23

Interchange Node (ICN) 107

interface flows

between APPN nodes 449

between LUs 452

between network node and end node 451

between network nodes 450

intermediate node

intermediate node APPN 13

Intermediate Session Routing 13

introduction to APPN 431

K

keywords

L

LAN (token-ring and Ethernet) DSPU links 33

LAN Gateway Links 35

LAN Manager 46

LAN over Coax with APPN 57

Ethernet 57

IBMXLN 57

LAN over Coax with APPN (*continued*)

NDIS drivers 57

WPCSP 57

LAPS

configuration 390

LEN 431

LEN Routing

LEN-SSCP 27

LEN/Subarea routing 14, 17, 27

LFSID 44

LIC feature numbers

APPN LIC feature numbers 105

Peer LIC feature numbers 105

Link activation 14

Link activation phases 14

link characteristics and capabilities 15

link station roles, 15

Link Type Definition 109

Link Types 30

LIST_DEST

LIST_REQ

load balancing Using Multitail 29

Local LU 6.2 Session Status 55

local node name 394

LOCATE search requests 17

log mode 396

LU 6.2 Services 13

LUNAME same as CPNAME 13

M

Management Services 11, 13, 46

Management Services LU 6.2 Support 3

Management Services Transport Architecture 110

migrating

Migration Data Host (MDH) 107

Mode/COS Correlation

#BATCH 461

#BATCHSC 463

#CONNECT 467

#INTER 464

#INTERSC 466

default COS 86

terminology 435

MODEENT 111

MODETAB parameter 111

MODETABL 111

modified commands

MS Application Routing to/from Served ENs 47

MS data 13

MS requests 13

Multi-link TGs (Multitail) 41

Multiple link support 14

Multiple links into a LEN 5

Multiple Transmission Groups (TGs) 41

Multitail 27

N

- NCP Considerations
- Negotiable TG numbers 41
- NetAddress 390
- NetBIOS configuration 390
- NetView 46
- NetView Distribution Manager/2
- NetView DM/2 file service commands
- NetView DM/2 installation
 - server feature installation window 406
- NetView DM/MVS
- NetView DM/MVS reporting functions
- NetView DM/MVS user exits
- Network Management 46
- Network Management Vector Transport 13
- Network Management Vector Transport (NMVT) 46
- Network Node
 - functions provided by 432
- Network node server 14, 15
- Network Node Server list 126
- Network Nodes Services
- Network Qualifiers 40
- new commands
- NMVT 13
- node identities 15
- node Type 2.1 447
- node types 444
- non-activation XID 3 38
- null XID 31

O

- OAF/DAF 44
- on-LAN Customization 3
- Online Test
- Online Test 15 50
- Online Test 17 50
- Online Test 17 option 2 11
- Online Test 3 50
- Online Tests (RAS) 50
- Operational Changes 46

P

- parallel channel 5
- parallel session 13
- Parallel TG Considerations for LEN Connections 41
- parallel TGs conditions 40
- Parallel Transmission Groups 40
- Partial Wildcard Definition 26
- partner LU 396
- Patch #AD2F 168
- Peer Communication LIC feature 3
- Peer Communications
 - 3174-peer bridge profile panel 98
 - APPN and Peer combined 66
 - Ethernet 57
 - 3** peer capabilities 5

Peer Communications (*continued*)

- IBMXLN 57
- LAN addressing 64
- LAN Manager support 65
- NDIS drivers 57
- Peer bridge 65
- Peer function 57
- Peer internal bridge 63
- Peer internal token-ring 63
- Peer LIC feature 57
- Peer logical view 63
- Peer physical configuration 63
- WPCSP 57
- peer communications with appn
 - DOS support 58
 - Ethernet 57
 - OS/2 support 60
 - workstation requirements 57
- peripheral border node 42
- Personal Communications platform
- PLU-SLU traffic 43
- pre-negotiation phase 15
- Predefined TG numbers 41
- predefinition of LUs 17
- primary link station 15
- Providing Backup Links Using Multitail 28
- pseudo-Focal Point 13
- PTFs, PTRs
 - AS/400 116
 - B00B SSCP takeover 112
- PTR B00B 112
- PU name control vector 38
- PUNAME 40
- PUs on CCAs 45
- PVC

Q

- Q612 18
- QUERY_REP
- QUERY_REQ
- Question 242 36
- Question 611 (Q611) 33

R

- register LUNAMES 17
- RELEASE_REQ
- remote administrator
- remote administrator workstation
 - installation 406
 - LAPS NetBIOS support 390
 - user profile management considerations 390
- remote domain
- request
- response file
- RETRIEVE

role
Routing Services 12
RPQ 8Q0935 4
RPQ 8Q1041 (TCP Enhancements) 4

S

SABME 15
SDLC link 5
SEND
session
 NetBIOS 391
Session (NetBIOS) 391
session limit 397
Session Management Exit (SME) 19
Session Services 11, 12
shared 31
shared access transport facility (SATF) 48
shared DSPU/APPN 5
Shared link support 110
single link multiple host (SLMH) 18, 40
SLMH 27
SNA base profile 394
SNA connections profile 395
SNA defaults 398
SNA features profile 396
SNA sense codes
SNMP MIB II 4
SNRM 15
software requirements
 APPN LIC feature 105
 APPN LIC feature numbers 105
 Peer LIC feature 105
 Peer LIC feature numbers 105
specific definition of LUNAMES 22
Specific LU Definition 23
SSCP 112
SSCP takeover 15, 41
SSCP Takeover Before Link Establishment 39
SSCP-Takeover 30
Subarea Routing 17, 27
subnetworks 42
subordinate Remote Administrator
subordinate remote administrator workstation
summary of NetView DM/2 V2.1 enhancements
Supported Links
Surrogate Resource 22
Surrogate resource support 14, 29
SVC

T

TCP/IP 2
terminology
 adjacent node 434
 APPN end node 434
 APPN network node 434
 class of service 435
 composite node 436

terminology (*continued*)
 connection network 435
 control point 435
 CP-CP sessions 435
 DLUS 435
 end node 434
 interchange node 436
 intermediate network node 436
 LEN end node 436
 LEN node 436
 logical unit 436
 migration data host 436
 mode name 436
 multiple link support 436
 network node 434
 node 436
 peripheral node 437
 sscp takeover 437
 system services control point 437
 topology database 437
 transmission group 437
 type 2.1 node 437
 virtual routing node 438
TG change 15
TG number 38, 41
Topology and Routing Services 11, 12
Topology Database Updates 33
transaction programs 397
Transmission Groups
Transmission Groups (TGs) 40
transmission plan

U

Unsupported Links
user exits
user profile management 390

V

VTAM
VTAM Class-of-Service Table 112
VTAM Considerations
VTAM Definitions for AS/400 A 170
VTAM Definitions for AS/400 B 170
VTAM IOBUF 110
VTAM node type 108
VTAM SSCP Takeover 38
VTAM Start List 109
VTAM start options 108

W

Wildcard 17
Wildcard Enabled 21
Wildcard in a Single Link Multiple Host (SLMH) 20
wildcard routing
 customizing for wildcard routing 80, 81

workstation
wrap 4

X

X.25 links Physical Unit ID 36
XID 0 or 1 31
XID 3 31
XID exchange 30
XID Processing 31

**International Technical Support Organization
3174 APPN Implementation Guide Update
October 1995**

Publication No. SG24-4171-01

Your feedback is very important to help us maintain the quality of ITSO Bulletins. **Please fill out this questionnaire and return it using one of the following methods:**

- Mail it to the address on the back (postage paid in U.S. only)
- Give it to an IBM marketing representative for mailing
- Fax it to: Your International Access Code + 1 914 432 8246
- Send a note to REDBOOK@VNET.IBM.COM

Please rate on a scale of 1 to 5 the subjects below.

(1 = very good, 2 = good, 3 = average, 4 = poor, 5 = very poor)

Overall Satisfaction	_____	
Organization of the book	_____	Grammar/punctuation/spelling _____
Accuracy of the information	_____	Ease of reading and understanding _____
Relevance of the information	_____	Ease of finding information _____
Completeness of the information	_____	Level of technical detail _____
Value of illustrations	_____	Print quality _____

Please answer the following questions:

- a) If you are an employee of IBM or its subsidiaries:
- | | |
|--|------------------|
| Do you provide billable services for 20% or more of your time? | Yes_____ No_____ |
| Are you in a Services Organization? | Yes_____ No_____ |
- b) Are you working in the USA? Yes_____ No_____
- c) Was the Bulletin published in time for your needs? Yes_____ No_____
- d) Did this Bulletin meet your needs? Yes_____ No_____
- If no, please explain:

What other topics would you like to see in this Bulletin?

What other Technical Bulletins would you like to see published?

Comments/Suggestions: (THANK YOU FOR YOUR FEEDBACK!)

Name

Address

Company or Organization

Phone No.



Fold and Tape

Please do not staple

Fold and Tape



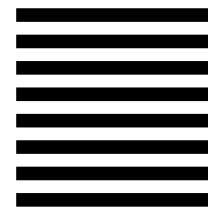
BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IBM International Technical Support Organization
Department HZ8, Building 657
P.O. BOX 12195
RESEARCH TRIANGLE PARK NC
USA 27709-2195

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES



Fold and Tape

Please do not staple

Fold and Tape



Printed in U.S.A.

S624-4171-01

